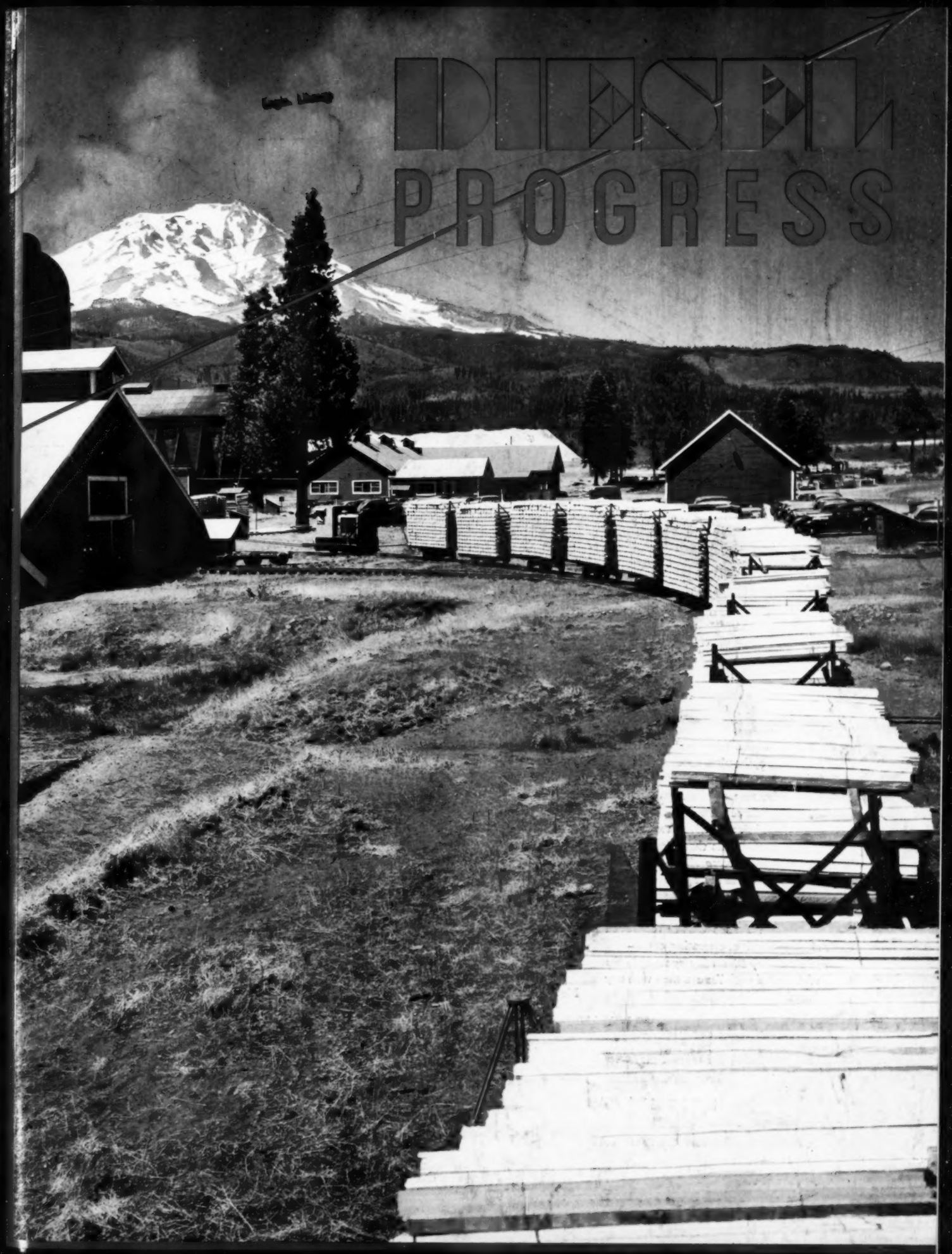

FEBRUARY, 1941

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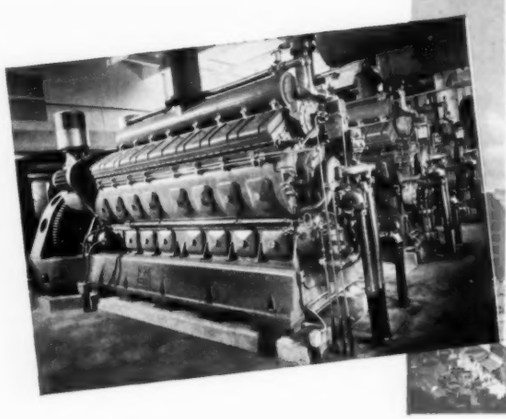

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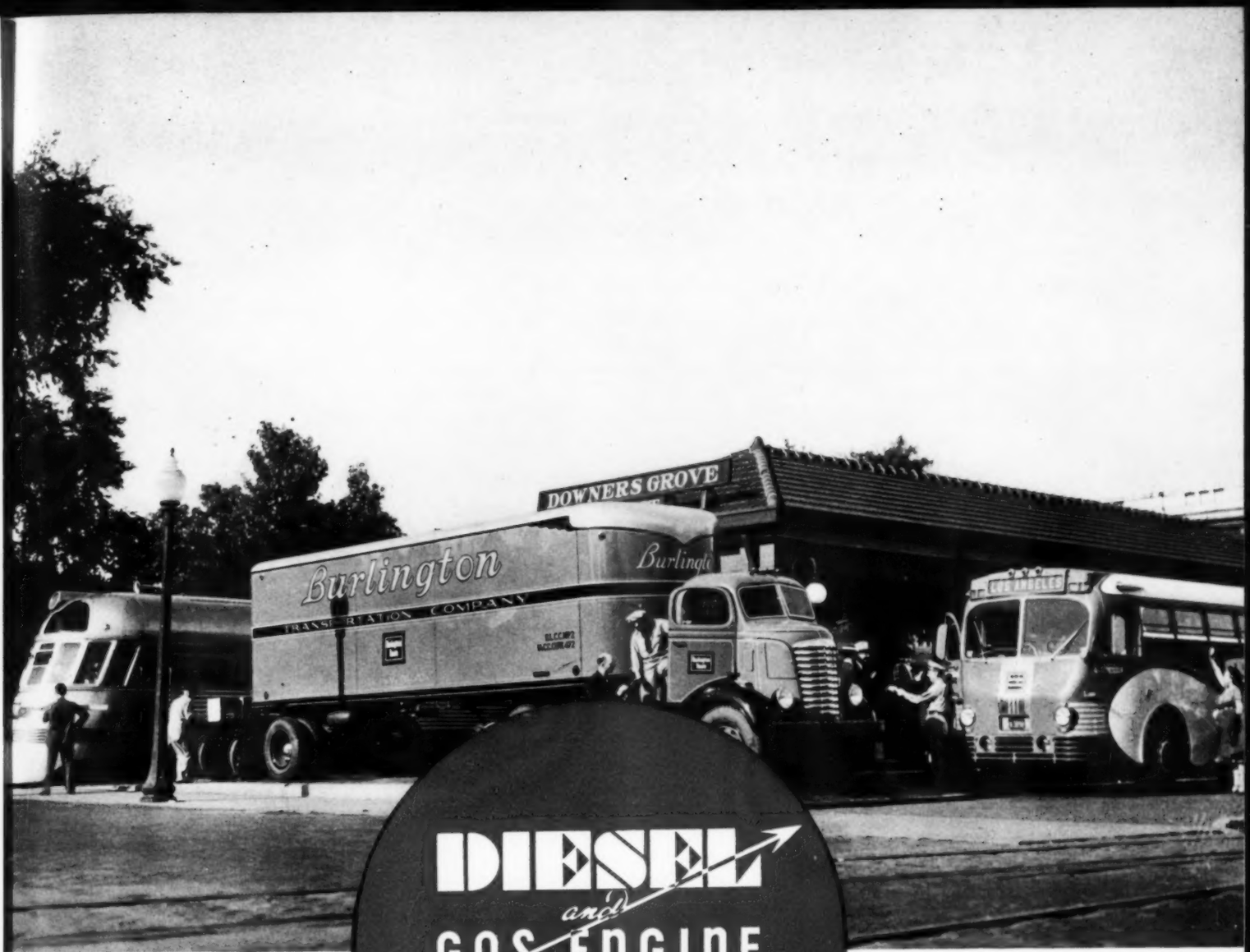
FOR ALL DIESEL ENGINES

DIESEL PROGRESS for February, 1941. Volume VII, Number 2. DIESEL PROGRESS is published monthly by Diesel Engines, Inc., 2 West Forty-fifth Street, New York, N. Y. Rex W. Wadman, President. Acceptance under the Act of June 5, 1934, at East Stroudsburg, Pa., authorized March 27, 1940. Subscription rates: United States and Possessions $3.00. Canada and all other countries $5.00 per year. Single copy price 25 cents in U. S. A., 50 cents for all other countries.



DIESEL and GAS ENGINE PROGRESS

REX W. WADMAN
Editor and Publisher

FRONT COVER ILLUSTRATION: Diesel-equipped industrial locomotives are proving tremendously profitable from one end of this country to the other. The McCloud River Lumber Company, McCloud, California, is successfully using a Vulcan locomotive powered with a Caterpillar Diesel hauling Ponderosa and Sugar Pine lumber. The unit operates ten hours a day, averaging about one gallon of 5c fuel per hour.

TABLE OF CONTENTS ILLUSTRATION: A unique photograph showing the wide application of Diesel engines in transportation service. The Burlington Zephyr Diesel-electric train on the left is powered with an Electro Motive Diesel engine, the truck in the center is equipped with a General Motors truck Diesel, and the bus on the right is likewise equipped with a General Motors two cycle Diesel with hydraulic drive. This is a splendid example of how a progressive railroad adapts Diesel engines to three different types of transportation, all under their own control and ownership.

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SOUTH NORWALK, CONN.

By WILBUR W. YOUNG

THE turn of the year witnessed another important step in the exceptionally long and successful history of the South Norwalk Electric Works, which is one of the oldest in the country, and now one of the largest Diesel plants in the East. This was completion of the installation of a 3,000 hp., 7 cylinder, 2 cycle, Nordberg Diesel and a 2,000 kw., 2300 volt General Electric alternator which have now been "on the line" some two months. An outstanding example of tremendous progress in design and the object of much pride on the part of all concerned, this new generating unit is the culmination of almost fifty years of judicious municipal power plant ownership and management in South Norwalk.

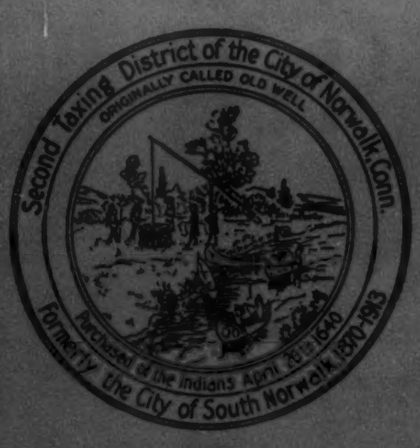
To those communities that visualize their own power plant at some future time, especially those that are fighting opposition, the unbroken success record of The South Norwalk Electric Works through the last forty-nine years will serve as both a challenge and an inspiration—a challenge to win against all odds; an inspiration for untiring effort.

From the forty-seventh annual report of the Board of Electrical Commissioners of the Second Taxing District, (which constitutes the former City of South Norwalk), City of Norwalk, Connecticut for the period from January 1, 1939, to December 31, 1939, we learn that the total revenue was $270,118.41, an increase of $10,587.54 over the previous year; that the operating expenses were $170,999.48, and that the net income was $72,520.41 after deducting retirement expenses of $29,158.49. Also, that a dividend of $58,168.00 was appropriated for the elimination of district taxes due from the tax payers in the Second District during this period. Further, that the Electric Works set up and furnished current for Christmas lighting for the entire district from December 2 until after January 1 at no cost to the merchants. During the period from January, 1930, to December, 1939, this plant contributed a total of $420,154.21 in dividends to ornamental lighting and various other civic improvements. Such are the benefits derived from municipal electric plant ownership under management in which politics has no voice.

Concluding the report, the Commission stated it had been considering surveys and reports relative to additional generation and that it hoped to enlarge that branch of the service during the coming year. That was at the close of 1939. By the end of 1940, the Commission's hopes were indeed realized with the completion of the 2,000 kw. Diesel generating unit.

But let us trace the steps which lead to this great achievement in an unbroken chain of progress from October 18, 1892, when the plant was first put in service.

The equipment consisted of one 125 hp. boiler and a 100 hp. steam engine driving two 60 arc lamp dynamos. The purpose of the plant was to provide street lighting only. On August 1, 1898, a limited commercial service was started on a flat rate basis. The equipment used consisted of two Watertown steam engines, each driving a 60 kw. 220 volt two wire direct current generator. In 1900, two additional 100 hp. engines were installed with 60 kw. generators. Growth of the load necessitated the addition of a 300 hp. engine driving a 165 kw. machine.


Second Taxing District of the City of Norwalk, Conn.
ORIGINALLY CALLED OLD WELL
Purchased of the Indians April 20th 1640
Formerly the City of South Norwalk 1870-1913

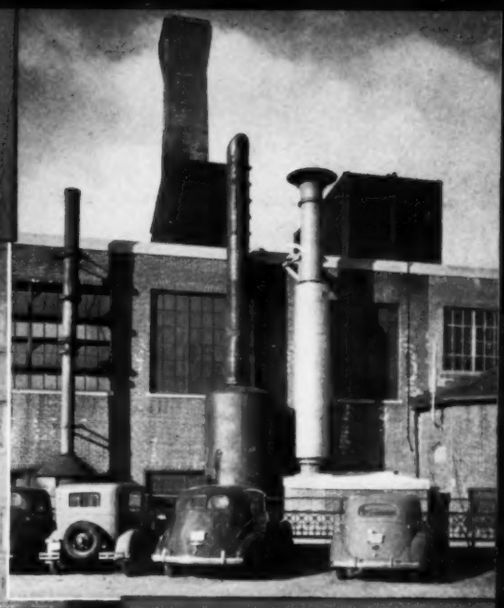
To forestall an unwarranted increase in peak load, it was found necessary to abandon the flat rate service charge and install meters on the system. With the change to metered service, the plant was put on a 24 hr. per day operating schedule. Previous to this, lighting service was supplied during the evenings only. May 1, 1903, was the date on which twenty-four hour metered service was supplied. Installation of meters resulted in a marked decrease in the peak loads at first, but the natural growth of the plant made it necessary to plan an additional capacity. It was at this time that Diesel prime movers were first considered. Investigation of the engines existent at this early date resulted in the purchase of an engine made by the American Diesel Co. This engine was placed in service on Oct. 18, 1905. The unit was a 3 cylinder, 225 hp., 10" bore by 24" stroke, air injection engine, injection air being furnished by a motor driven compressor. The generator on this first Diesel was a 165 kw. 250 volt two wire direct current unit. Further growth in plant load resulted in the installation of a similar Diesel unit of the same make in 1909.

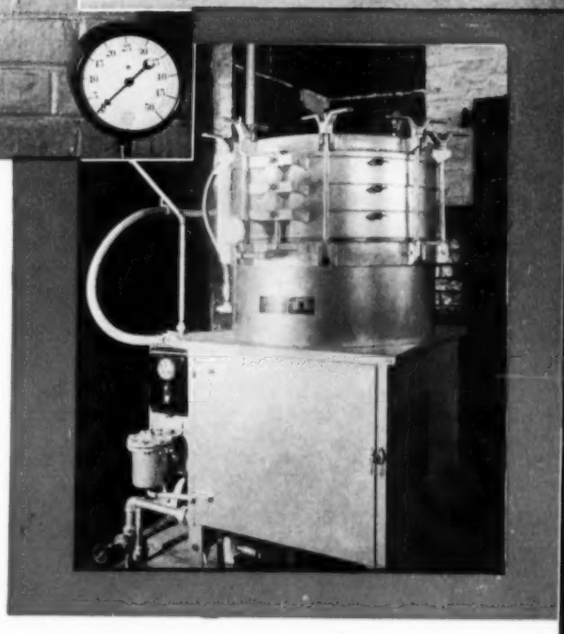
In 1910, another engine of the same size and type as the previous units was installed. This engine was purchased from Adolphus Busch who bought the American Diesel Engine Co.

During the period of the World War, the station load increased and pending investigation of the course of future expansion a contract was entered with the neighboring private utility for the purchase of a part of the station supply. Energy was received as alternating current which was converted to direct current by means of rotary converters. These rotary converters were operated in parallel with the Diesel engines. The entire output of the plant up until January 29, 1924, was 220 volt, two wire direct current. Due to the compact area served, this system had worked out well, it being quite similar in operation to the direct current systems still in use in some of our large cities.

With the increased growth of the more prevalent alternating current systems in surrounding communities, it was decided to install an alternating current distribution system served entirely from the purchased power source. This system grew rapidly until, in 1930, the alternating current output represented almost one half of the entire station output.

In 1929, active planning for the installation of a Diesel engine for generation of alternating current was started. A new building was built on the site of the old boiler room. A complete new building sufficient for three engines was built and the Diesel unit installed. This engine was a 1,600 bhp. McIntosh & Seymour unit, 8





cylinders, 20″ x 24″, air injection, 300 rpm. driving a 1,110 kw., 2300 volt, 3 phase generator, and was placed in service in October, 1930. The three old Diesels were definitely discontinued after the installation of this engine. The oldest of these units was twenty-five years old—the youngest unit was twenty years old. The McIntosh & Seymour engine was operated in parallel with the purchased power source during peak loads with the engine taking its rated load. Purchased power was and still is used for off peaks and standby.

In 1940, plans were drawn up for the installation of the present 3,000 bhp. Nordberg Diesel. With increasing load demands, it was felt that additional station generating capacity should be installed to provide greater peak load capacity and insurance against failure of the purchased power source.

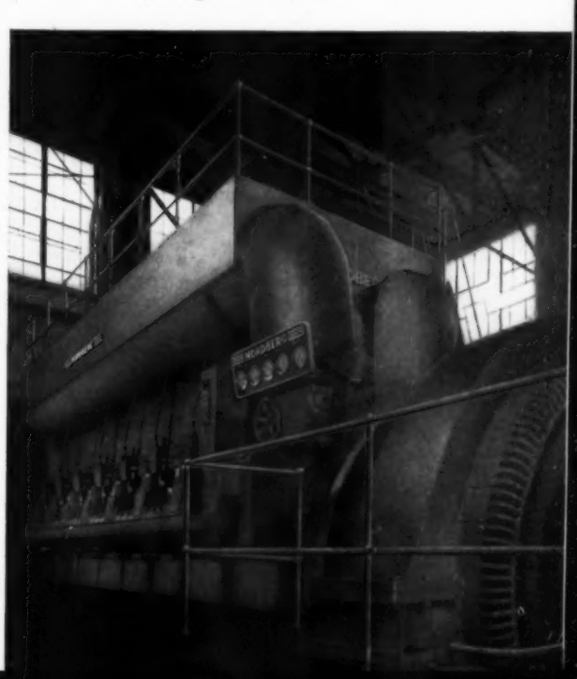
This new Nordberg engine stands as a fine example of progress in Diesel design; of how engineering skill has packed more power in a given amount of space, without adding proportionate weight, and of how these big, ungainly machines have been cleaned-up in exterior appearance. The judicious use of enclosures and the arrangement of headers and pipes gives an overall compact and clean effect which amounts to streamlining. Even the ladders and runways blend into the general "clean" lines of the engine. Yes, "functional design" is the word. Everything is enclosed that can be and even the Woodward IC governor, American-Bosch fuel injection pumps, Roots-Connersville scavenging blower and Motoco bearing and jacket thermometers, as well as the Manzel cylinder lubricators are blended into the smooth lines of the engine.

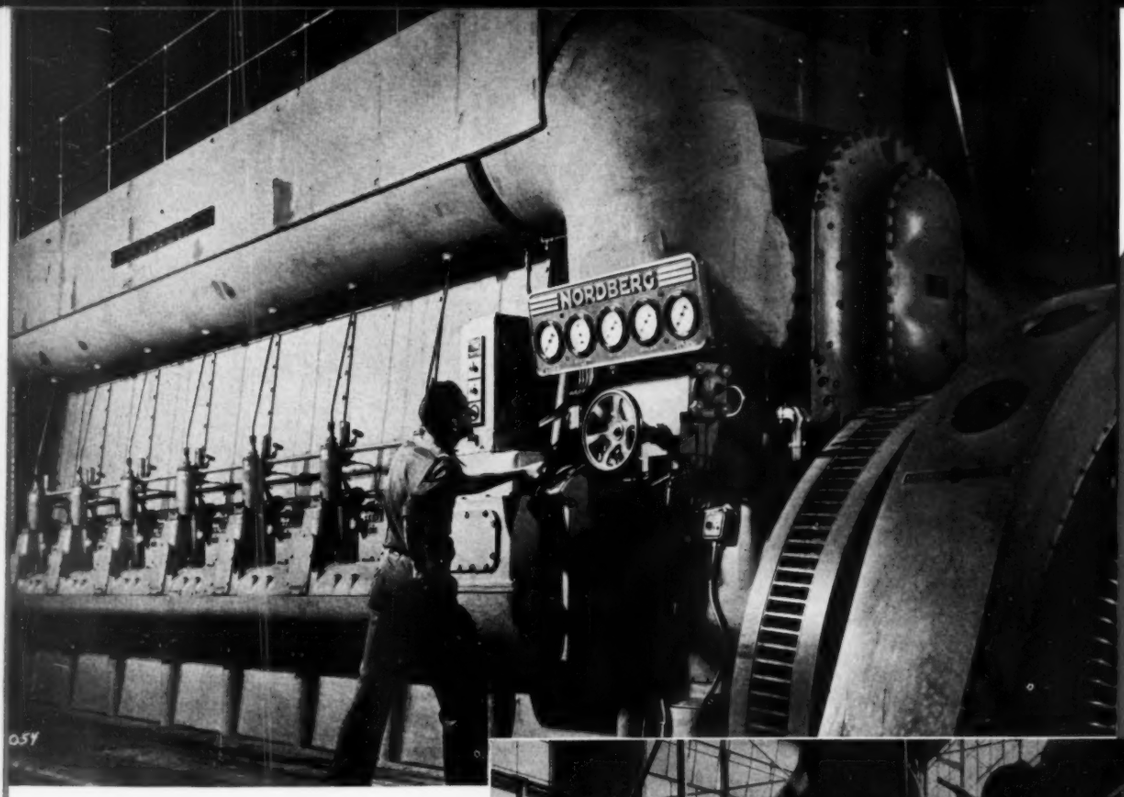
Simplicity marks the general hook-up of this plant. The engine room is clear of all accessories except the wall-mounted Alnor seven point exhaust pyrometer and Viking lube oil pressure and jacket water temperature safety control which serve the new engine, also a King-Seely Telegauge for checking fuel storage. In an adjoining room are installed in compact arrangement the Gardner-Denver, 250 cfm. starting air compressor, also a Norwalk auxiliary compressor and the Hilco lube oil reclaimer which is arranged for batch cleaning from the lube oil settling tank. Gulf Parvis and Gulf Harmony lube oils are used. Also located in this room are two Jennings centrifugal motor driven cooling system pumps, one of which circulates water through the Fluor atmospheric roof-mounted tower and the other handles circulation through the engine jackets. The cooling system is open and City water is used without treatment.

In the pit surrounding the engine sub-base are arranged the essential elements of the fuel supply system. A Goulds rotary pump brings the fuel from a 15,000 gal. underground storage tank through a Pittsburgh Equitable meter to the 250 gal. day tank from which it is drawn by a built-in engine pump through Nugent duplex filters and thence to the injection system. Gulf Diesel fuel oil is used. Also in the pit is the Schutte-Koerting lube oil cooler which is connected into the engine cooling system. All valves and fittings are Crane.

Adjoining the engine room is the intake air filter house in which are fitted American air filters and surmounting it is the vertically mounted Burgess intake Snubber. The Burgess Exhaust Snubber is mounted parallel and close to the intake. Both intake and exhaust are practically inaudible, a definite "must," since the plant is in the heart of the district which

Upper left: Front view of the So. Norwalk, Conn., Electric Works. Next: The Viking safety control and Alnor Pyrometer which serve the new Nordberg Diesel. Next: View showing the Burgess exhaust and intake Snubbers and, just above, the Hilco lube oil reclaimer. Below: View of the new Diesel from generator end.





Close-up view of the new Nordberg Diesel, showing the controls, air and oil gauges, Woodward governor, Roots-Connersville scavenging blower and American Bosch individual injection pumps.

The 1600 bhp., 8 cylinder McIntosh and Seymour Diesel which has been in service in this plant since October, 1930.

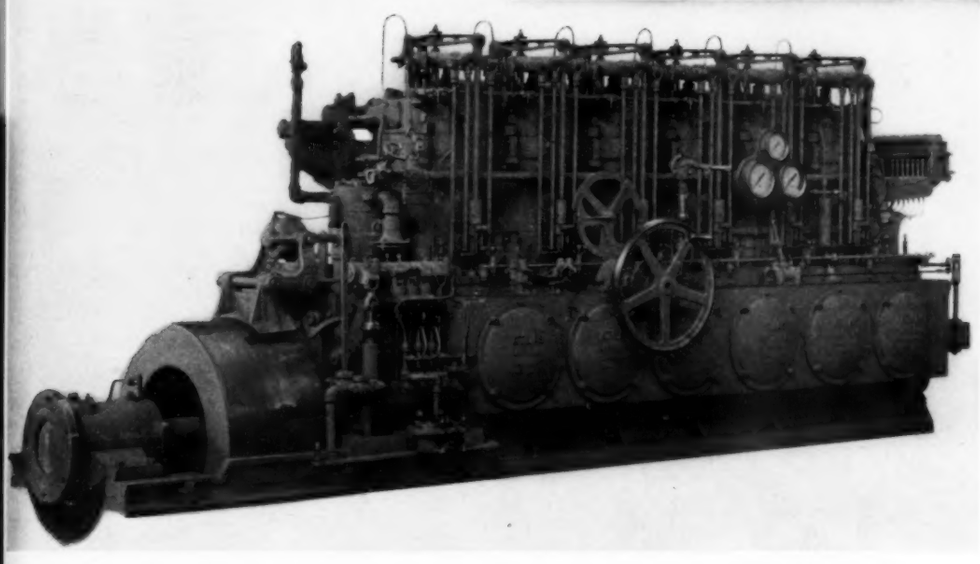
it serves and is surrounded by both business and residential buildings.

Since the McIntosh & Seymour Diesel was installed while the output of the plant was virtually all direct current, all of this engine's accessories were, and still are, dc operated. To keep these accessories running in emergencies, (they haven't forgotten the hurricane of September, 1938, up this way), a Cummins 6 cylinder, 1,200 rpm. Diesel equipped with Leece Neville electric starting direct connected to a General Electric 40 kw. dc. generator stands ready to handle such situations. The McIntosh & Seymour Diesel is fitted with Manzel cylinder lubricators and a De Laval centrifugal lube oil reclaimer. The switchboard is G.E.

A word about the personnel. M. W. Mosher, Chief Engineer, has been on the job a long time as has the entire crew. Mr. Mosher said, "I went to work here when I had to use both hands to pull a double knife switch and I have stuck it out through the years . . . this is all I know." Which in our opinion is quite a bit to know. Fine consideration of the human side of management is reflected all through this splendid organization, credit for which is due Gen. Supt. E. J. Splan, his able assistant W. J. Cuneo, and the Board of Electrical Commissioners, Oliver F. Dorward, Thomas Robins, and J. A. O'Connor. W. H. Reed of Mamaroneck, N. Y., is consulting engineer to the Board.

MORNING STAR

By JIM MEDFORD



The latest in "baby" tuna clippers, "Morning Star" leaves San Diego on her initial voyage southward.

Shop view of the operating side of the main Diesel, an Atlas direct reversible engine rated 220 hp. at 335 rpm.

MORNING STAR, newest "baby" tuna clipper to join the Southern California fishing fleet, is a true miniature of her larger sisters cruising farther south into equatorial waters. Designed by Adolph Larson, naval architect, for the builders, Al Larson Boat Works of Terminal Island, for Agostino Zolessi and Westgate Sea Products, owners, of San Diego, California, the ship is 78 ft. over-all; 21 ft. beam; 11 ft. moulded depth, and is of all wood construction.

Accommodations for crew of ten, the galley with 1,500 gal. water tank under sub-floor, and the bait tank structure are located on the main deck. The upper or boat deck carries the combination wheelhouse, chartroom, radio room, and master's quarters. Amidships are stowed the Gray 4-40 powered 18 ft. dory and a net skiff used in bait seining.

The main power plant is an Atlas Imperial six cylinder, 10"x13", 4 cycle direct reversible marine Diesel, equipped with Alnor pyrometer, developing 220 hp. at 335 rpm. On the trial run at 250 rpm., the craft logged 8.5 knots. The tail shaft is of 4½ in. Tobin bronze swinging a 60 in. Pitchometer three blade wheel.

The engine room is a gem in compactness, an essential feature in these smaller cargo carriers, extending the full width of the vessel but only 15 ft. between bulkheads. Elimination of the usual wing fuel tanks permitted the placing of two 6 cyl. 65 hp. Buda Diesels 30 kw., 125 volt DC generator sets, one on either side of main engine; the Kohlenberger 5x5 ammonia compressor and the main switchboard, respectively, forward of the port and starboard auxiliaries; the Westco 30 gal. capacity fuel transfer pump two 6 in. Fairbanks-Morse vertical centrifugal bait pumps with 7½ hp. motors, and a 3 in. Fairbanks-Morse centrifugal bilge pump with 5 hp. motor, port to starboard along the after bulkhead. Other equipment includes: 3 in. Fairbanks-Morse centrifugal general service pump and 3 hp. motor; Worthington 8 cu. ft. air cooled compressor V-belt driven by 3 hp. motor; dual water pressure systems; ILG engine room blowers; Johnson electric anchor windlass, 5 hp. motor; wooden bitt type single niggerhead cargo winch, 3 hp. motor. Fairbanks-Morse electrical equipment is used throughout, with exception of the Westinghouse generators of the Buda auxiliaries.

Fuel oil capacity is 7,700 gallons in three deep tanks, one in the bow and two in the stern; sufficient for 3,000 cruising miles. Cargo capacity is 100 tons of iced fish, which is exceptional for a vessel of this size.

One of the fleet of Sterling tank trucks powered with Cummins Diesels.

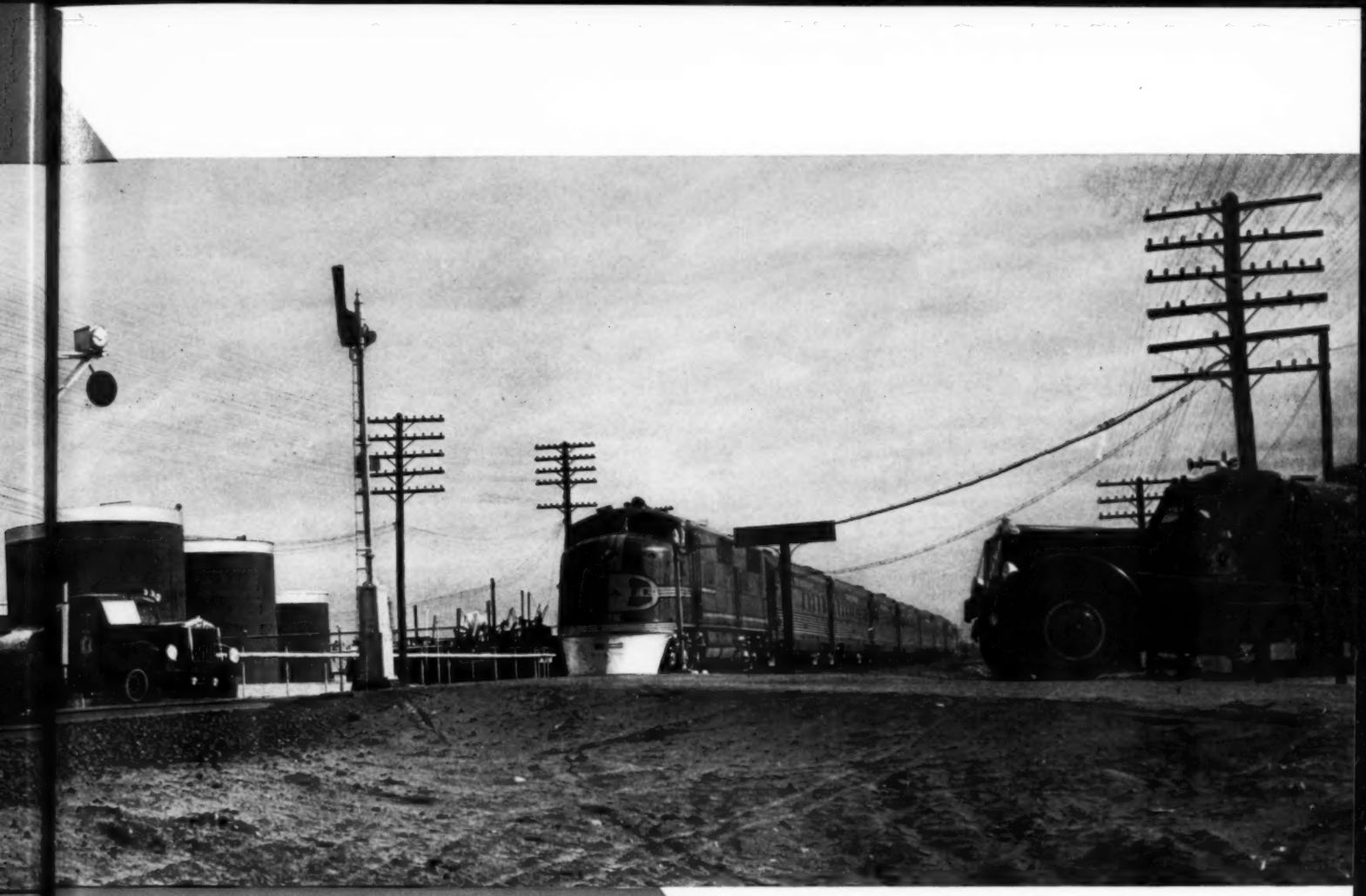
MOHAWK PETROLEUM COMPANY'S DIESEL TRUCKS

By VAL WILLIS

IN the race for supremacy on land and sea in transportation equipment, Diesels appear to be far out in front. Our attention is particularly called to the progress made in highway transportation, and we cannot overlook the recent development in railway equipment forced by the competition of Diesel-engined trucks. While the railroads have concentrated their improvements principally on passenger traffic, Diesel trucks have been delivering long haul freight at passenger train schedules, resulting in a large percentage of cargo being hauled by truck within a radius of five hundred miles.

A concrete example of Diesel truck efficiency is found in the case of the Mohawk Oil Company, of Bakersfield, California. From this point they transport gasoline in 7,000 gallon loads, with their trucks, all powered with Cummins 150 hp. Diesels, and trailers, to all points within the state of California. Their remarkable success in both economy and speed of delivery brought about a request to find a reason for this transportation achievement. I visited the Bakersfield plant and was introduced to Mr. Dewey Poulsen, Superintende of Motor Transportation for this compan who very courteously explained his method operation and maintenance of their large fl of Diesel transport trucks. Mr. Poulsen fi invited me to inspect one of these big "la cruisers"—a Sterling truck, equipped with 2,900 gallon cargo tank, pulling a Beall trai of 4,100 gallon tank capacity, making a to of 7,000 gallons of gasoline per load, which understand is the largest number of gall possible to transport under California weig restrictions.

I was rather startled to be invited to drive th big outfit, but I was more surprised at ho quickly this 150 hp. Diesel engine respond to the throttle and picked up this load with t getaway speed of a passenger car. After a lit excursion around the plant I was then structed to drive into the main garage ov long pit where I was to be shown a most co plete "finger tip control" system of ma nance, which is where my story really beg Fifteen minutes after I stopped this sixty fo truck and trailer over the maintenance pit, t



Two Mohawk Diesel engined transports give right-of-way to a Diesel streamliner, the Santa Fe "Super Chief".

following operations were performed and the unit was ready to be dispatched on another long trip from Bakersfield to San Francisco with 7,000 gallons of gas: Engine oil changed; Oil filter pack replaced; 22 tires checked for air; Truck refueled; Radiator water checked; Batteries checked; Transmission checked for grease; Differential checked for grease; All grease points lubricated on both truck and trailer; Service recorder chart removed and replaced; All principal units inspected; such as brakes, air connections, clutch, transmissions, starting system, steering hookup, etc.

I understand this amount of work formerly required a minimum of two hours before the installation of this equipment.

For those who are statistically minded, I find this fleet of ten Sterling trucks, powered with Cummins Diesels, average 15,000 miles per month each, for a thirty day month of 720 hours, or an average of 22.2 miles per unit for each hour on the calendar, or 532 miles for each calendar day. I do not mean to leave the impression that these vehicles travel every hour in the calendar, since all machines have to be lubricated and adjusted, but I do say Mr. Poulsen is doing a swell job of keeping Mohawk trucks on the road.

While these ten Diesel trucks pile up better than 5,000 miles per day, Mr. Poulsen states that he has very few road service jobs.

The entire maintenance crew consists of one mechanic for each eight-hour shift and one swing shift man, making a total of four, and one grease man. This crew maintains ten Sterling Diesel truck trailer units and eight additional gasoline trucks used for local delivery. The Diesel trucks service the entire state of California with about 30% of their mileage being over the famous Ridge Route between Bakersfield and Los Angeles.

Replacing 18 gasoline transport units, these Diesels have not only increased the gallonage delivered by 30%, but have reduced the total cost of maintenance by more than 50 per cent. A steady flow of Diesel operation has shown a remarkable saving in tire life over the entire records produced by gasoline truck operation. While this is comparatively a new fleet, the first unit having gone into service September 1, 1938, in eighteen months this first Diesel truck has piled up over 300,000 miles. The average truck mileage of this fleet at the present time is over 100,000 miles per unit. Some original tires are still in service that were delivered on the first unit, and the tire records to date indicate an average tire mileage of 200,000 miles per tire, a commendable record.

Whoever applied the term "Finger Tip Control" to Mr. Poulsen's maintenance equipment, could include his entire method of operation. His office records are such that he can put his finger on any information desired concerning any item of cost or performance throughout his entire fleet. By adopting one make of truck, engine and trailer, his operation is so uniform that he can tell you within thirty minutes the location of any of his trucks—enroute or at destination point. This is a tribute to the value of standardization and the efficiency of Diesel transportation for long haul work.

Roy Pyle, secretary, manager of the El Camino Irrigation District, Gerber, California, starting one of his Diesel pumping units. Mr. Pyle says, "We are pumping one-third more water now than we were with electricity, and doing it at one-third the cost." Left: View of another Diesel pumping unit exposed to the four winds. Note the discarded electric motor on the ground.

This 45 hp. Diesel engine direct-connected to a Johnson deep well pump delivers 1,500 gallons of water per minute to the thirsty land.

EL CAMINO IRRIGATION DISTRICT

SEVEN thousand, five hundred forty-six acres of rich, productive California farm land lie in the El Camino Irrigation District at Gerber in Northern California. Rolling, colorful orchards, level wheat fields, and geometric rows of corn provide a good living for 600 progressive farm residents in this territory. There is no idle luck in the fact that these men and women make a good living year in and year out, that their crops are both good and constant, and that their profits are considerable. The District has banded itself into a business organization which turns out a maximum of earnings at a minimum of cost.

There are 265 farms on the land, varying in size from 1.71 to 2,300 acres; but all with a single problem — sufficient water. It did not take long to realize this fact in a land where the summer months frequently pass without measurable rainfall and where moisture is comparatively scarce for at least two other months of the year.

Dozens of workmen have dug sixty-five miles of ditches during past years. Ten, twelve and fourteen inch underground irrigation pipes criss-cross the land to assure water when it is most needed by the growing crops. Thirty-one wells are worked as much as twenty-four hours a day to provide the district's water needs.

With costs for this gigantic pumping job pyramiding over the years, the District, in search of greater profits, has been discarding other forms of power and installing Diesels. Today, it has the largest installation of Diesel units in the United States for irrigation pumping. Sixteen of its wells use Diesel engines to bring up the precious water and send it coursing through the miles of pipe to thirsty trees and plants. The fifteen other wells will also be Diesel-pumped as soon as the changes can be made.

Although the irrigable area of the El Camino District is considered the same as its total size in acres, no more than 6,037 acres have been actually irrigated in any one year. To set down the water needs of this amount of territory requires some moderately technical if not elaborate statistics.

The District's maximum requirement is 2.5 feet per acre for the entire season, and a little more than one-fifth of this is packed into the driest month, July. During this month, the engines and pumps need a capacity sufficient to deliver .009 cubic feet of water every second to every acre under irrigation. In other words, to handle the 6,037 irrigated acres, a pumping capacity of 54.33 cubic feet per second is required twenty-four hours a day.

Until this year, the combined capacity of the pumping plants owned by the District, was sixty-one cubic feet per second, or about two cubic feet per second per unit. By enlarging several of the pumps and changing to Diesel engines, however, this capacity has been increased nearly one-third, giving a safe margin of expansion for future needs.

As an example of typical work being done by one of the sixteen Diesels on the job, a three-cylinder Caterpillar Diesel engine, rated at 45-hp. for continuous service, pumps 1,500 gallons a minute, or 3.3 cubic feet a second on a 63-foot lift. This is sufficient to irrigate 280 acres under all conditions. Operating 24 hours a day this unit consumes the moderate amount of 2.8 gallons of fuel an hour.

Last year, seven similar Diesels were installed by the District to replace more expensive forms of power. Nine more were put on this spring. Only after carefully checking the operating costs and the dependability of these units did the District decide that, as quickly as possible, all its pumping work would be turned over to Diesel engines.

"STANOLIND A". DIESEL TOWBOAT

By GEORGE D. CROSSLEY

THE Standard Oil Company's new towboat, "Stanolind A", home port Evansville, Indiana who began her career of towing barges on the Ohio and Mississippi early in November, represents a new high point in boat-building efficiency and luxury of equipment.

Streamlined, Diesel-propelled, capable of pushing six barges loaded with 2,400,000 gallons of oil products against the current, this powerful new addition to the inland merchant marine is fitted up to provide for officers and crew comforts almost equal to those of a private yacht.

The "Stanolind A" is 144 feet long over all, 35 feet in the beam. Her depth is 8½ feet. From the outside she presents a broadside view of low-lying deck and cabin, topped by twin stacks and a business-like pilot house set on top the Texas. From her towing knees to her twin tunnel-type propellers aft, her lines follow the historic graceful sheer of the correct river towboat. She has no high super-structure, however, to catch the wind, as was the case with old time towboats.

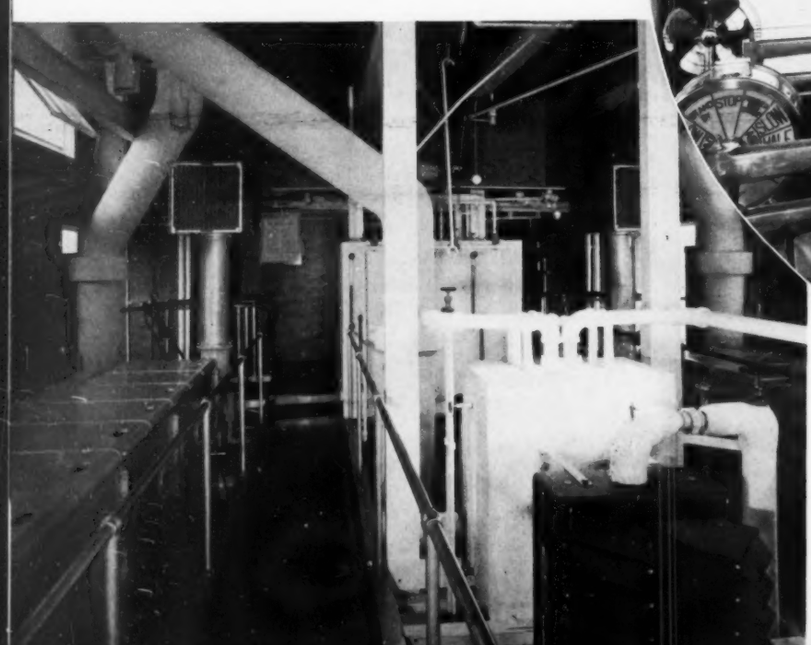
Power for the propellers of the new boat is furnished by two 600 hp. Busch-Sulzer Diesel engines. Auxiliary equipment is operated on current provided by a pair of 40 kw. generators driven by Kahlenberg engines.

The two Busch-Sulzer propulsion engines are of the 4 cycle, direct reversing marine type, 8 cylinders, 13″ bore, 20″ stroke, each rated 600 hp. at 300 rpm. These engines are single acting with trunk pistons and American Bosch fuel injection. Attached accessories are a centrifugal jacket water pump, rotary type lubricating and fuel oil booster pumps, Nathan mechanical lubricators and a clutch-controlled, V-belt driven Gardner-Denver maneuvering air compressor. The controls for both engines are grouped on a centralized stand with the gaugeboard mounted above. Rectangular type Multi-Point Alnor pyrometers are mounted on the gaugeboard. Purolator filters are fitted for both fuel and lube oil.

Arrangements on the towboat are simple and compact. In addition to the engine room and various other spaces for operation purposes, there are thirteen staterooms, including seven for the crew, six for officers, and two spare.

Entering from the forecastle, a passageway leads aft through the deck storeroom past the engineer's and assistant engineer's staterooms. Then come the engine room and a transverse passageway, back of which are the crew's state-

Captain Charles E. Reinhardt at the steering controls in the pilot house of the "Stanolind A."



Upper engine room view showing the tops of the two Busch-Sulzer Diesel propulsion engines extreme right and left. Note American Air Filter installation at rear and above each engine.

rooms with their shower baths and lavatories. The officers' and crew's mess rooms and the galley are aft from the crew's staterooms.

The captain's and pilot's staterooms, and lounge and one spare room are located on the Texas deck forward, and above these sits the pilot house. In place of the old-fashioned pilot wheel, the "Stanolind A" is steered by levers and hydraulic steering gear.

With an eye to the comfort of its river men, Standard has made furnishings on the "Stanolind A" modern and homelike. The kitchen of an up-to-date housewife is no more efficiently equipped than the "Stanolind A's" galley with its oil burning range, its two electric refrigerators, its sink and drain board, its lockers and bins and dish racks, its electric coffee urn, electric fans and clock. And all the kitchen gadgets are stainless steel.

The mess rooms for both officers and crew have virtually the same furnishings and equipment—swivel chairs of modern design, sideboard and long center table.

In each of the crew's seven staterooms there are two metal berths, two lockers for clothing and personal effects, wall coat-hooks, a drop leaf wood table mounted against the wall, a chair, berth curtains, a 15 inch electric fan, washbowl with hot and cold running water, towel rack, tooth brush holder, soap dish, plate glass mirror and cabinet over the wash basin. An electric light in every berth makes for easy reading in time off duty.

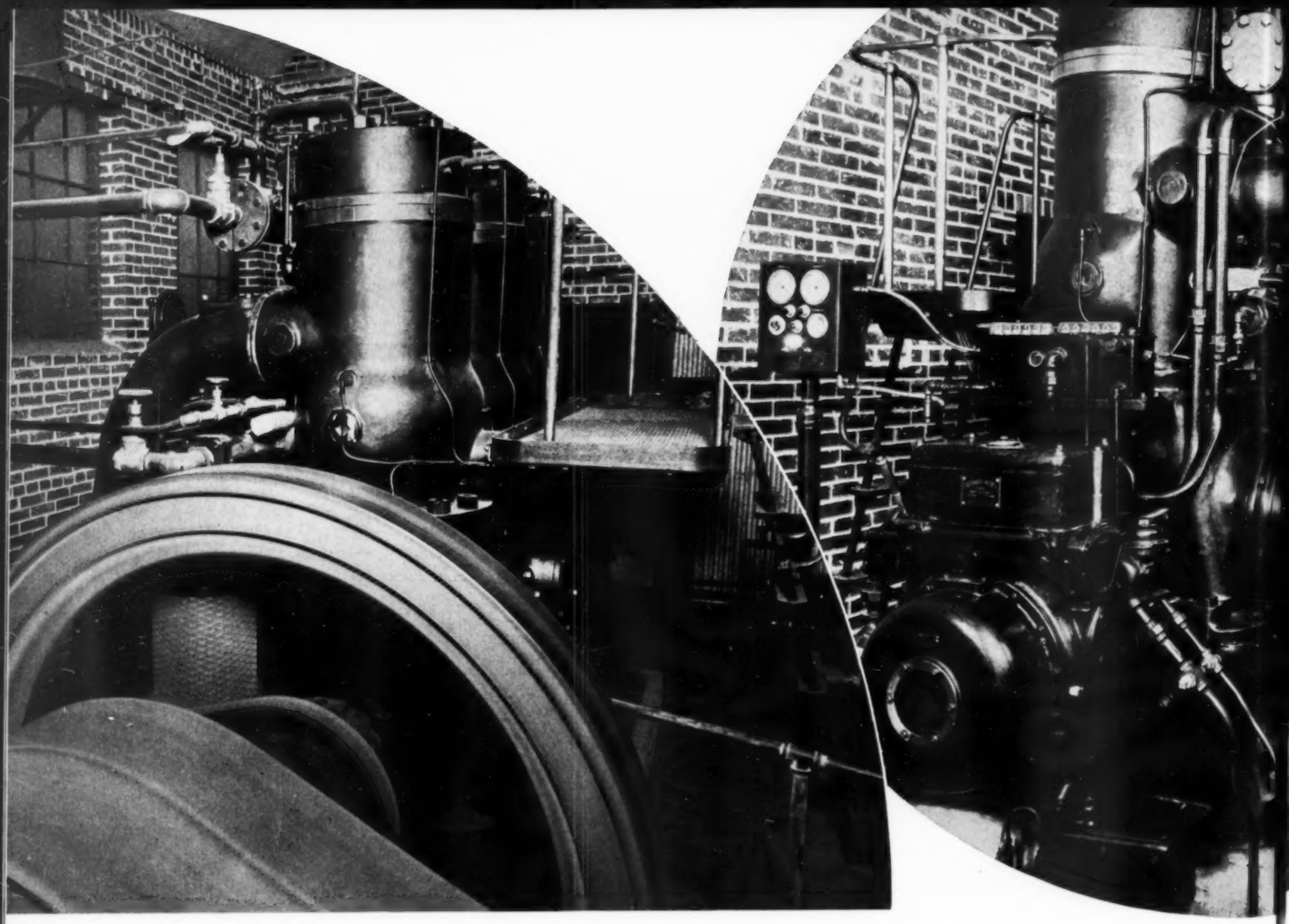
The assistant engineer's staterom, except for a combination desk-bureau, is virtually the same as a crew stateroom. The captain, the pilots, and the chief engineer have somewhat more elaborate quarters with built-in berths, bureaus, and large arm chairs. They also have electric fans, adjoining lavatories and shower baths.

The pilot house would please and surprise Mark Twain, could he return to the rivers on which he once piloted steamboats. He would like the high swivel chair, on which the pilot now sits before his levers, no less than the arm chair, the built-in settee, the long wooden case for charts, the instrument case, the electric fans, and the heating arrangements which (in place of the old time coal stove) temper also the quarters of officers and crew, the laundry, and the mess rooms.

Maxim Silencers and sound-deadening material on the walls of the engine room reduce the noise of the machinery to a minimum. The pilot and the engineer can talk to each other through loud speaker microphones as well as by the usual telegraph.

Although designed exclusively for river towing, the "Stanolind A" was built on Lake Michigan by the Manitowoc Shipbuilding Company at Manitowoc, Wisconsin. On completion, she came under her own power down the Lake to Chicago, where pilot house, stacks, and mast had to be removed to enable her to go under the bridges on the drainage canal. At Joliet the superstructures were replaced and she proceeded down the Illinois River to the Mississippi at Grafton, down the Mississippi to the junction with the Ohio at Cairo and up the Ohio to Evansville, her home port.

The "Stanolind A" pulling up to the wharf at Evansville, Indiana, her home port.



FLOUR MILL DIESEL

By R. D. CAMPBELL

THE banks of the Missouri River have been dotted with flour and grist mills since the opening of the West a century ago. The Missouri River borders or passes through the great grain producing states of South Dakota, Nebraska, Kansas, Iowa, and Missouri before it reaches the "Father of Waters". Here was transportation and power—two essential items in turning raw material into dollars. As the century rolled on, river transportation was outmoded by the railroad, and water power was replaced by steam power. Today, Diesels are bringing back river transportation and are replacing steam power in many of these mills.

Typical of such mills is the G. H. Dulle mill located in Jefferson City, Missouri, overlooking the Missouri River. This mill specializes in delicate cake flour and, up until the summer of 1940, used a Corliss steam engine as a source of power. Other mills in this vicinity have installed Diesel engines in recent years, and an investigation by the Dulle Milling Company led them to the selection of a Diesel to replace the steam engine.

The engine selected was a three-cylinder, 225 hp. Fairbanks-Morse two-cycle Diesel. This engine has 14″ x 17″ cylinders and runs 300 rpm. The extension shaft from the engine flywheel carries the main mill pulley and pulleys for the water pumps and a small D.C. generator. No clutch or disengaging mechanism is used, and the engine is started with all the mill line-shafting and belting connected to it. The engine operates from seven o'clock in the morning until six o'clock in the afternoon, six days a week, throughout the entire year. The average load on the engine is about 170 hp. with a variation of only about 20 hp. above or below this average under extreme conditions.

The fuel is purchased in tank car lots and is unloaded by gravity. It is stored in a 12,000 gallon horizontal above-ground tank located in the yard behind the mill building. Gravity flow is used in transferring the fuel from the storage tank to the 300 gallon day fuel tank located underground near the engine room. The contour of the ground and the location of the railway siding on high ground permit the

Two views of the 225 hp. Fairbanks-Morse Diesel installed in the G. H. Dulle flour mill. Extreme left, note the Burgess intake Snubber showing through the flywheel. In the other view is seen the control end of the engine with Garrett protective unit.

use of gravity flow for fuel transfer and no pumps are required.

The fuel used is a straw colored distillate from the mid-continent fields having the following properties and characteristics:

Viscosity at 100° F.	40 S.S.U.
Conradson Carbon Residue	1% maximum
Sulfur, % by wt.	.25% maximum
B. S. & W., % by wt.	.03% maximum
Flash Point	180° F.
Pour Point	0° F. maximum
Distillation, 90% over	600° F.
Heat Value	19,600 B.T.U./lb.
Cetane Number	56

Each cylinder of the engine is fitted with an individual exhaust pipe which carries the exhaust gases downward to an underground exhaust duct. The duct extends along the engine foundation and outside the building to an 18" x 20' spiral welded exhaust stack. Each cylinder exhaust elbow is fitted with a thermocouple connected to an Alnor pyrometer which indicates the temperature of the exhaust gas.

The engine cylinders and crankpin bearings receive oil from a Madison-Kipp force feed lubricator. The oil falling into the sump is drained to the dirty oil pump which continuously forces it through a pair of size D-1 Briggs Oil Clarifiers. The filtered oil is stored in a twenty gallon filtered oil tank which supplies the clean oil pump. The clean oil pump delivers oil to the force-feed lubricator, the governor housing, and the wells under each main bearing. The main bearings are lubricated by ring oilers rotated by the crankshaft and dipping into the oil wells.

A closed cooling system is used for the engine jacket water. The raw water circuit includes a Marley atmospheric type of cooling tower located atop the mill building, and a pump to circulate the water through the heat exchanger and to the cooling tower. The soft water circuit includes a pump, a type "BCF" Ross Cooler, and a fifty gallon expansion tank. Both the raw water pump and the soft water pump are 1½", Figure 5530 Fairbanks-Morse centrifugal pumps and each is separately driven by means of a flat belt from pulleys on the main extension shaft. The soft water pump circulates about eighty to ninety gallons of water per minute, with the water entering the engine at 120° F. and leaving at a temperature ranging from 125° to 130° F., depending upon the load on the engine. The raw water pump discharge is controlled so as to maintain the proper rate of heat exchange for the soft water circuit. The quantity of raw water circulated is varied according to the atmospheric conditions affecting the heat transfer rate of the cooling tower.

Thermometers are located on the water discharge from each cylinder, and on both the inlet and outlet sides of the raw and soft water circuit. Both pumps are located on the engine room floor and are the lowest points of their respective water circuits. The expansion tank on the soft water circuit is supported on a wall bracket well above the highest part of the engine. The tank is fitted with a sight gauge glass indicating the water level in the tank. The cooling system is complete in every detail, yet it is relatively simple and compact and is very accessible for cleaning and inspection routine.

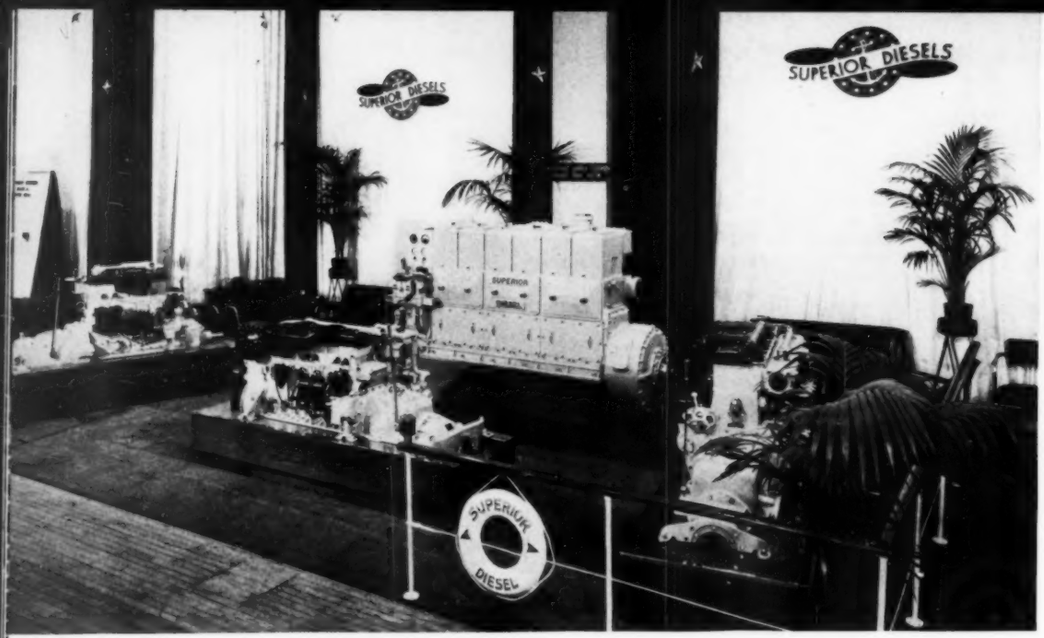
The air starting equipment consists of a single stage 3" x 3½" Fairbanks-Morse compressor belt driven by a 2 hp. 1800 rpm. electric motor. The air is stored in two 20" x 60" welded steel air tanks designed for 250 pounds working pressure, and fitted with U. S. Gauge Company pressure gauges reading from 0 to 300 pounds. The tanks were built by the Pressed Steel Tank Company and were supplied through the Diesel Plant Specialties Company. The small size of the air starting equipment is quite a contrast when compared to similar equipment for marine Diesels. In this particular installation, the engine is in a warm engine room and is started only once a day; while marine engines may have to be started and reversed as much as a dozen times in a five minute period of maneuvering.

All air entering the engine is drawn in through a Burgess Snubber located at the flywheel end of the engine base. The Snubber may be inspected and serviced while the engine is in operation.

The extension shaft from the flywheel is supported on two outboard bearings, and carries the main pulley driving the mill and smaller pulleys driving the water pumps and a 10 kw. D.C. generator. The belt from the main pulley to the mill is a twenty-four inch Goodyear Compass Cord belt with a belt speed of 3300 feet per minute. The D.C. generator is used to supply current for the electric lights and other small auxiliaries in the engine room and throughout the mill.

The engine is protected by a Garrett Protective Device which sounds an alarm and a light signal in the event of low oil supply in the lubricator, low water pressure or high water temperature. The device, which includes the indicating gauges and signal lights, is mounted on the engine platform at the control end of the engine. As the engine is unattended much of the time, the "growler" or signal horn is located in the mill where it will attract the miller's attention.

An engine room was added to the mill to house the new Diesel engine. It is of brick and concrete construction and measures 14' x 32' inside dimensions. The roof is gabled, and the ridge-pole is an I-beam designed to carry a hoist and trolley which passes directly over the center-line of the engine cylinders.



Especially featured in The National Supply Company, Superior Engine Division, exhibit was the Model SMRA-6, 4½" x 5¾", 6 cylinder supercharged Diesel, which is now in quantity production for the government. The three other models shown were representative of the entire line which ranges from 25 to 950 hp. These were a Model MRD-4, 5½" x 7", 4 cylinder, 90 hp. workboat engine; a Model 1M, 6 cylinder, rated 235 hp. at 700 rpm.; and a MRD-6, rated 170 hp. at 1,500 rpm.

This Show witnessed the first display of Cummins Engine Company's newest development in supercharged Diesels, as well as its complete line of supercharged Marine Diesels. The new job is Model LMRS-600, 6 cylinder, 7" x 10", rated 325 hp. at 1,000 rpm. for heavy duty service. In contrast to this largest unit was Cummins smallest supercharged Diesel, Model AMRS-602, 6 cylinder, 4" x 5", rated 135 hp. at 2,200 rpm. A third unit shown was Model HMRS-600, 6 cylinder, rated 200 hp. at 1,800 rpm., Models AMR-600 and HMR-600 were seen.

Buda Company's full line of pleasure and workboat Diesels, all with Lanova combustion system, were attractively displayed in larger space than in previous shows. Workboat 6 cylinder models were 6-DHM-1879, 6¾" x 8¾", 248 hp. max. with Twin Disc gear; 6-DHM-909, 5¼" x 7", 177 hp. max., and 6-DHM-691, 4¾" x 6½", 150 hp. max. For pleasure craft there were two 6 cylinder models: 6-DTM-468, 4¼" x 5½", 108 hp. max., and 6-DTM-317, 3⅝" x 5⅛", 90 hp. max. Also shown was Model 4-DTM-212, 3⅝" x 5⅛", rated 50 hp. max.

Gray Marine Motor Company occupied its usual large space and exhibited the five Diesels comprising its full line, based upon the engine built by General Motors and adapted for marine service by Gray. These Diesels are of uniform bore and stroke, 4¼" x 5" and range from 1 cylinder, 25 hp., 2 cylinder, 55 hp., 3 cylinder, 82 hp., 4 cylinder, 110 hp. and 6 cylinder, 165 hp.

Nineteen different makes of Diesel engines were exhibited in the Grand Central Palace at the 1941 New York Motor Boat Show.

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THE MOTOR BOAT SHOW

Caterpillar Tractor Company stepped up into larger space this year, with an exhibit which included its entire line of marine Diesels and featured two new engines, recently announced to the trade. These new models are D7700 and D8800, both 4 cylinder which develop 60 and 70 hp. respectively.

AGAIN, in this thirty-sixth annual Motor Boat Show, Diesels dominated the motive power and auxiliary exhibits. And again, Diesels were the center of interest on the part of both lookers and buyers. Yes, orders were taken and hundreds of potential buyers were listed. A spirit of optimism and general satisfaction over the business outlook was reflected by all of the personnel who handled the crowds attending this most successful show.

New faces among the exhibitors and new models punctuated the rise in favor of Diesel for both marine propulsion and auxiliary service. An old, familiar exhibitor, the Marine Division of the Chrysler Motor Company, announced and displayed its new marine adaptation of the Dodge Truck Diesel with Lanova combustion system. A most significant event! Scripps Motor Company featured in its large space the Scripps Super Diesel, a marine adaptation of the Hercules engine rated 84 hp. at 2600 rpm. Notable, also, among the new exhibitors was Lister-Blackstone, Inc., with its line of auxiliary units. New models highlighted many of the exhibits with emphasis on the workboat types of Diesels; and so on. . . . New developments in design—new models to fill out lines—all tending toward more universal availability of Diesel economy and safety.

In the spacious General Motors booth was seen glistening, under brilliant lights, the 8 cylinder, 2 cycle, 600 hp. at 1,500 rpm, in-line engine of especially compact lines which was developed by the Cleveland Diesel Engine Division for Naval service, also the familiar 3 cylinder 71 series unit with direct connected generator of 40 kw. capacity.

Seen for the first time in the Waukesha Motor Company exhibit was the new "Vigilant" Model 143HN, 6 cylinder, 4" x 6", 152 hp. at 1,800 rpm. Waukesha-Hesselman oil engine. "Defender" Model 6WAKH was shown with Dynamatic transmission.

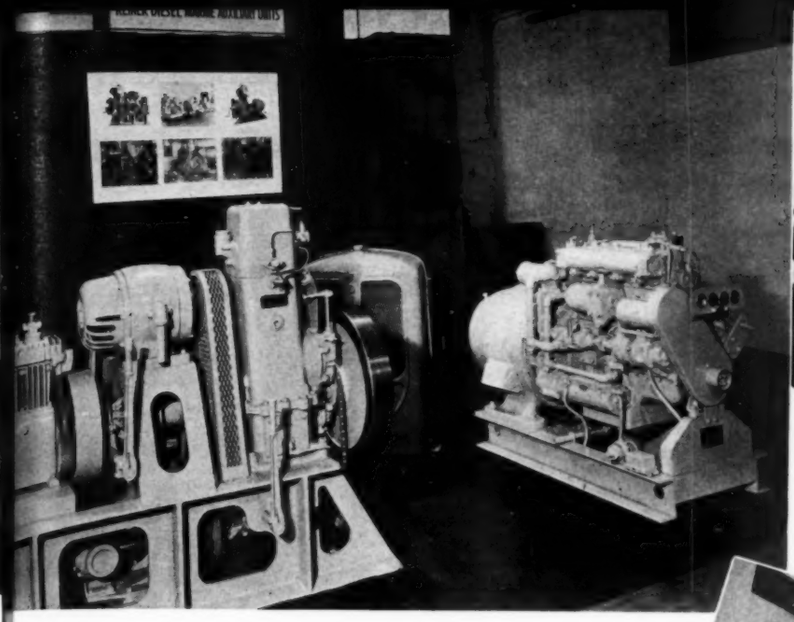
This successful Show launched the Diesel Industry on a year of high-pitched production in all lines of marine construction.

Atlas Imperial Diesel Engine Company again showed the Atlas-Lanova, 5 hp., 3 kw., single cylinder, 3⅛" x 3¾" Diesel, self-contained generating set for 3 kw. output. Dominating this exhibit was the Atlas Model 6 EM253, 6 cylinder, 6¼" x 8¼", 4 cycle Diesel rated 135 hp. at 900 rpm., representing its new line of medium speed marine Diesels.

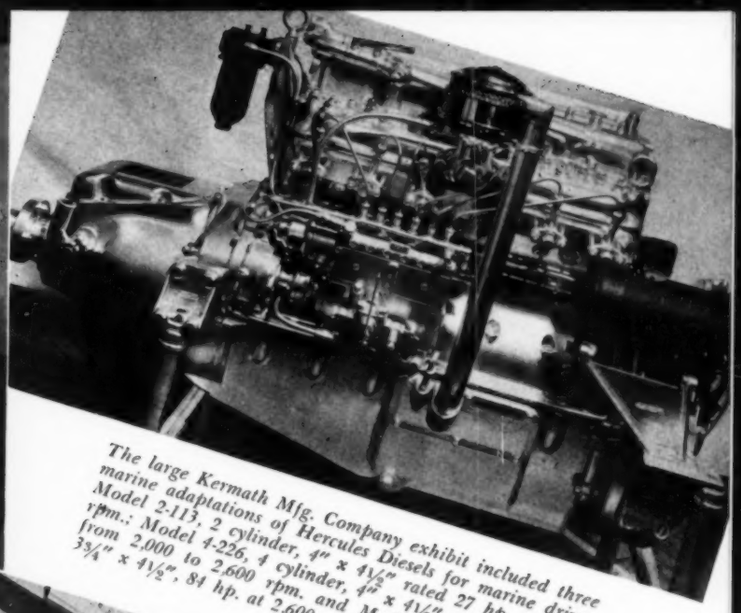
Mack Manufacturing Corporation came back this year with a larger line of Marine Diesels featuring two new models. The five models shown were 405Y and 405W, both 4" x 5⅜", rated 100 and 80 hp. at 1,950 and 1,800 rpm. for pleasure craft and workboats respectively; 605Y and 605W, 4⅝" x 6", 140 and 100 hp. at 1,800 and 1,500 rpm. for yachts and workboats respectively; and an exploded Model 519Y, 4⅜" x 5¾". The line of Mack Diesels is based on three basic 6 cylinder models, and all employ the Lanova Combustion system.

Lister-Blackstone, Inc. (lower left) made its first appearance in the Show this year with a complete marine auxiliary unit, Type 18/2, using an 18 hp., 2 cylinder Lister Diesel, 10 kw. generator, a 44 cfm. Quincy compressor and a 250 gpm. service pump; also a single cylinder Lister Diesel V-belted 2½ kw. marine generator set.

Always alert to trends, Chrysler Motor Company, Marine Division, made its initial showing of a 6 cylinder, 3¾" x 5" Marine Diesel rated 85 hp. at 2,400 rpm. equipped for fresh water cooling and offered with a wide range of reduction gear ratios. This engine, illustrated below, is a marine adaptation of the Dodge truck Diesel which employs the Lanova combustion system.



John Reiner & Co., Inc., builders of marine auxiliary units, displayed its Model A-5-W complete auxiliary set consisting of a single cylinder Stover-Lanova Diesel, Quincy Compressor, service pump and 2-3 kw. Star generator; a 4 cylinder Hercules Diesel 15 kw. generating set, and the new 2 cylinder Stover-Lanova Diesel equipped with radiator and Rockford over-center clutch for deck auxiliary service.



The large Kermath Mfg. Company exhibit included three marine adaptations of Hercules Diesels for marine drive: Model 2-113, 2 cylinder, 4" x 4½" rated 27 hp. at 1,800 rpm.; Model 4-226, 4 cylinder, 4" x 4½" rated 55-65 hp. from 2,000 to 2,600 rpm. and Model 6-228, 6 cylinder, 3¾" x 4½", 84 hp. at 2,600 rpm.

United States Motors Corp. exhibit featured three interesting Diesel generating sets: Model R457, a 4 cylinder Hercules Diesel and 10 kw. direct connected generator; Model 2MD-5D, a 2 cylinder Hercules Diesel and 5-10 kw. generator; and a single cylinder Stover-Lanova Diesel with 3 kw. generator.

Typical of the trend to Diesel in marine application was the addition of a third model to the Palmer Bros. line of Diesels. This is the RND-6, a 6 cylinder, 4⅛" x 6" engine rated 60 hp. at 1,200 rpm. Also seen were the two models previously shown, RND-4, 4 cylinder, 4⅛" x 6", rated 40 hp. at 1,200 rpm., and RND-1, a single cylinder, 4⅛" x 6" Diesel developing 9 hp. at 1,000 rpm.

Hill Diesel Engine Company exhibited its line of R models, 2, 4, and 6 cylinder, all 3½" x 5½", rated 17 hp. at 1,500 rpm., 36 hp. at 1,500 rpm., and 64 hp. at 1,800 rpm., respectively, for marine drive, and 5-10 kw., 10-20 kw., and 20-30 kw., respectively, for generating sets.

Diesels again dominated the 1941 Motor Boat Show.

The new International cab-over engine powered with a 100 hp. Cummins Diesel is the pride of the Schuyler Oil Company, Schuyler, Nebraska. Equipped with a five speed transmission and a two speed axle, this unit hauls 3,980 gallon loads of gasoline from Kansas City to Schuyler, a round trip of 580 miles. Driver Guy Keller said, "With this Diesel I roll over long hills two gears higher than I can with gas power . . . it's got anything beat on the road, other drivers don't even try to keep up with it."

Phoenix Wood & Coal Company of Phoenix, Arizona, works four Autocar trucks powered with 150 hp. Model HB-600 Cummins Diesels transporting fuels from Los Angeles on a 24 hour schedule. Its first unit purchased in December, 1938, now has travelled over 430,000 miles. The manager said, "We couldn't consider any other type of power."

One of five Cummins Diesel-engined gasoline transport units operated by the M & M Truck Company in Denver. This unit, powered with a 150 hp. Cummins Diesel, was put to work in May, 1940. Assistant Manager, H. B. Wallin, said, "The runs we put these trucks on are all hills and at an altitude of 4,400 feet. . . ."

Powered with a 100 hp. Cummins Diesel, this International tank truck is owned by the Consumers Oil Company of Roggen, Colorado. The unit operates on a regular schedule carrying 3,814 gallons of gasoline to Roggen from refineries in Eldorado and McFerson, Kansas. Gross weight, 37,415; net payload, 25,172. The truck makes three 1,200 mile round trip runs to Eldorado every week. Each round trip takes 125-130 gallons of fuel and a driving time of 30 to 32 hours.

DIESEL TANK TRUCKS MAKE MONEY

By WILL H. FULLERTON

ONE who has driven west of Omaha three or four years ago and today cannot help but notice the tremendous increase in gasoline transport trucks on the highways.

The steadily increasing number of automotive vehicles, operating over today's improved highways, has demanded more filling stations and service depots. Today, it is difficult to get more than twenty miles away from a gasoline station and many a man has breathed a silent prayer of thanks because of it. This has been due largely to the gasoline transport truck. Its flexibility has made gasoline available at a reasonable cost in places previously considered inaccessible. In the gas transport industry itself, more and more of the truckers are turning to Diesel engines for their trucks.

It is generally known that the cost of transportation is a major item in determining the retail sales price of gasoline and fuel oil. This is brought home sharply to the traveler who can buy high-test gasoline for 12c to 15c per gallon in parts of Oklahoma and Kansas, yet must pay up to 25c and 30c for the same fuel in some sections of Arizona, Idaho and New Mexico.

In many areas, it has been said that the introduction and use of Diesels with their inherent over-all economy has forced a substantial reduction in retail gasoline costs.

Operators of Diesel-driven gasoline tank trucks show a profit on fuel, despite the fact that they

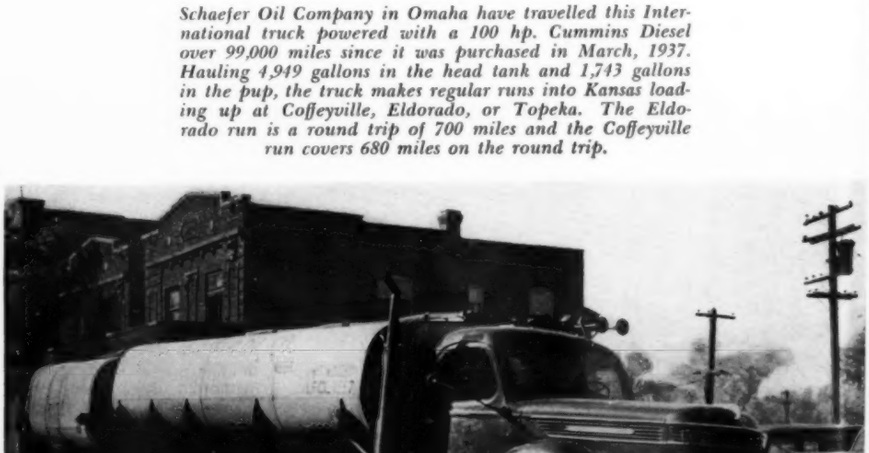
This beautiful gasoline truck is owned by the Yankee Oil Company, Omaha. Said to be the biggest in Nebraska, it hauls 3,400 gallons in the head tank and 1,840 gallons in the pup. The truck is an International powered with a 100 hp. Cummins Diesel. It makes 20 to 22 trips per month from a bulk plant in Superior to Omaha, a round trip of 365 miles which takes a running time of 10 hours, and 43 gallons of Diesel fuel averaged over 33 trips. The former gas powered unit hauling the same load used an average of 55 gallons of fuel per round trip.

can purchase gasoline at the refinery's wholesale quantity price. In some cases, they pay more for Diesel fuel than they did for gasoline.

This profit is made possible by a fuel economy characteristic of Diesels . . . the fact that a Diesel truck travels approximately twice as far on a gallon of fuel oil as a gas-powered tank can on a gallon of gasoline.

The Diesel's freedom from fire hazard is most important to the gasoline trucker. In addition, operators have proved for themselves that Diesel engines are more dependable and cost less to maintain. The Diesel's high torque at low rpms. speeds up travel over hilly roads. In the majority of cases, operators who have changed over from gasoline power have reduced their time on the road from one to six hours, depending on the length of haul and the terrain.

Schaefer Oil Company in Omaha have travelled this International truck powered with a 100 hp. Cummins Diesel over 99,000 miles since it was purchased in March, 1937. Hauling 4,949 gallons in the head tank and 1,743 gallons in the pup, the truck makes regular runs into Kansas loading up at Coffeyville, Eldorado, or Topeka. The Eldorado run is a round trip of 700 miles and the Coffeyville run covers 680 miles on the round trip.



THE MEN BEHIND THE DIESELS YOU BUY

BEATTY BRICKER WILLIAMS

Chairman, The Cooper-Bessemer Corporation. Trustee of Oberlin College

★ Born and reared in Shelby, Ohio, B. B. Williams has always had a predilection for things mechanical, especially those which furnish a means of locomotion. He recalls his boyish pride in owning the very first "safety bike" in his home town, and tells how it was put to use in his youthful business ventures. Any means of power production has always fascinated him. Graduating from Oberlin College in 1899, Mr. Williams spent a year in the steel business at Shelby. It did not, however, take him long to follow his natural bent, for in 1900 he joined The C. & G. Cooper Company at Mount Vernon, Ohio, a company, with sixty-seven years of engine building already behind it, which had built the first successful traction engine for farm purposes, the first steam locomotives fabricated west of the Alleghenies, and the first Corliss engines produced in the Middle-West. With a natural admiration of the Corliss engine, Mr. Williams foresaw the decline of those huge steam-driven power units and persuaded his associates to recognize the ascending sun of the internal combustion engine and embark upon its manufacture. In 1907, he became sales manager of the Company; in 1912 he assumed the duties of its secretary, and 1916 marked his elevation to the position of vice-president and general manager. Four years later he was elected president.

★ In 1929, The C. & G. Cooper Company and The Bessemer Gas Engine Company were merged, and Mr. Williams was elected president of the new corporation. Bessemer, too, had been pioneering Diesels and thus were pooled the interests of two great engine builders, with the groundwork already laid for production of the "coming" Diesel. From his office in Mount Vernon, B. B. Williams directs his company's operations and makes his many trips into the territories which its branch offices serve. It is not unusual to come upon him seated in that office with an overalled worker from the shops, both talking easily, with their chairs drawn close to the large walnut table. He resides at "Maplehurst," a ninety-five year old estate typical of the fine homes of the mid-nineteenth century, with curved driveways, great maples and wrought iron fences surrounding it. At "Maplehurst" you will note its owner's love of art and literature as shown by a fine collection of original etchings and a well-stocked and comfortable library. In all, here is a man who has not let forty years of strenuous work and the guiding of one of the largest engine building companies in this country dull his enjoyment of people and life . . . an enjoyment reflected in his zest for work and service to the community.

A SECTION DEVOTED TO THE OPERATING AND SUPERVISING ENGINEERS OF DIESEL PLANTS

By R. L. GREGORY

Editor's Note:—In response to many requests, we are glad to present a service devoted to the interests of Diesel Plant Supervising and Operating Personnel. This introductory article will be followed each month with timely factual discussions of practical Diesel operating problems and solutions as worked out in actual field practice: first-hand presentations of individual experiences. You can help us to make this department vitally helpful to all concerned. Address your inquiries and suggestions to DIESEL PROGRESS.

WE, who are connected with the Diesel Industry, are more or less familiar with the rapid development and the prominent place which the Diesel has attained as a motive power in the past two decades. Despite this phenominal growth, we are also aware that Diesel is still in its infancy. Present indications all point toward a vast expansion in the future use of this type of power. The principle upon which the Diesel operates was developed and experimented with long before James Watt built his first crude steam engine.

As early as the seventeenth century, scientists were experimenting with various forms of equipment and materials, working on the theory that useful power could be developed by igniting an explosive material in an enclosed container. Such men as Huyghens, Lenoir, Otto, and Brayton built various types of engines, operating upon this principle. Using these ancient experiments as a basis, Dr. Rudolph Diesel, with the help of other scientists and manufacturers, began working on an engine in Europe in 1892. His efforts were crowned with success in 1897 when he produced the first marketable engine. The year following, Adolphus Busch built the first engine in this country.

From this time on, however, until 1910, interest lagged in the Diesel. Some manufacturers and engineers continued to experiment along this line, but they met with many obstacles. They were hampered by patent restrictions; interest in steam operated units was at fever pitch and, consequently, the engineering profession was concentrating on steam engine development, believing that it held greater possibilities. Then, the weight of Diesels already developed was excessive, considering the power output developed. But, possibly the greatest drawback of all was the unreliability of the units to function as they should without excessive maintenance and care.

By 1910, however, great advancement had been made in the design and development of the steam engine and steam turbine, considering the few short years which this sort of equipment had been on the market. Progressive and far-sighted members of the engineering profession doubled their efforts in quest of an engine which would operate economically and efficiently on cheaper grades of fuel. So it wasn't long before many of them were again concentrating on the Diesel type of unit. They studied the theory of internal combustion and found that there were many angles and principles involved in it which they had heretofore overlooked. They built various types of equipment involving new design and, as they made progress in the results obtained, new and greater interest developed.

One by one, their problems were solved and they became more and more convinced of the economy which an engine built on the Diesel principle would produce. By 1920, several efficient units were in operation in various parts of the country. One thing still was quite obvious, namely, that the cost of maintenance and repair would have to be lessened, since this was offsetting the savings effected in fuel.

Gradually these objectionable features were eliminated and, by 1930, much improvement in the design was in evidence. Built primarily as a stationary unit, the Diesel began to invade the automotive field, then the shipping industry, and finally into the field of aeronautics. Then the depression came but, to the Diesel Industry, this cloud had a silver lining. With the slump, competition in business became keener to obtain what business there was, but it gave manufacturers an opportunity to devote more time to new designs. They took advantage of this opportunity and in the last decade the greatest progress of all has been made.

Today, the Diesel stands as a monument to the ingenuity and perseverance of those men who have developed it into the efficient unit which it has become. They are not resting on their laurels, however, and, as these engines come off the assembly floor in the various plants today, nearly every unit has improved features which were not incorporated in the design of its predecessor.

So much for the designer and manufacturer behind these engines. He is doing and will do his part to constantly improve his product. But, what about the men upon whose shoulders falls the responsibility of maintaining this equipment after it has been installed. The manufacturer, designer, or engineer has years of theory and experience behind him in the building of his product. But, in a majority of the cases where he installs them, the unit is new to the man who operates it. Granting that he has had experience with Diesels of various designs heretofore, when he adds a new one to his present equipment he finds many new things incorporated in the design, and new problems to face. And it cannot be expected that he be able to grasp these features as readily as the designer or manufacturer who is in daily contact with these changes and improvements. He does have, however, one advantage over the vendor of the particular unit over which he has charge. Being in daily contact with his present equipment has given him a knowledge of the local conditions and problems with which the manufacturer is not familiar. Therefore, when he installs a new unit as additional equipment, he has a fundamental idea of what his new unit must do to meet these local conditions.

It is true that no two units of the same make and design will function identically, just as no two plants will function identically. Therefore, an operating engineer or the man supervising the operation of any unit must be a student insofar as his particular plant and its operation are concerned. Each and every plant presents its own particular problems, and while there may often be a similarity to many of these problems in various plants, they will vary and are usually controlled by local conditions.

Now it has been said that "The greatest education a man can acquire is by contacting his fellow man and interchanging ideas with him."

. . . . . *Now please turn to page 43*

WITTE SPECIFIES AS STANDARD EQUIPMENT.. AUTO-LITE STARTERS

THE latest in Diesels will have the latest in starting motors—Auto-Lite's new two-step starting motor that meshes on reduced voltage, cranks on full. This new advancement provides quieter and more efficient operation and prolongs life of equipment. It eliminates possibility of damage of housing, pinion or ring gear. Starting motors are avaliable in both manual and automatic pinion shift types. The manual shift is foot-pedal operated and the automatic shift is push-button operated.

Auto-Lite Starting and Generating systems for Diesels are designed and built by the world's largest independent manufacturer of automotive electrical equipment.

The Auto-Lite Heavy Duty Voltage and Current Regulator is capable of maintaining voltage to within plus or minus 2%. Consists of 3 units in one water-and-dust-proof assembly: 1. Cut-out Relay (Circuit Breaker); 2. Voltage Regulator; 3. Current Regulator.

The Auto-Lite Shunt Generators are available for 12, 24 and 32 volt systems in capacities of 100 to 1,000 watts. This provides an ample range of capacities for such over-load requirements as special lights, two-way radio, etc. Auto-Lite Heavy-Duty Generators are ventilated by a system which has proved to be the simplest and most efficient yet devised.

For prices and complete details, write to

THE ELECTRIC AUTO-LITE COMPANY
TOLEDO, OHIO
ELECTRIC AUTO-LITE, LIMITED • SARNIA, ONTARIO
23 Divisions—More Than 400 Automotive Parts and Appliances

AUTO-LITE ✓STARTING ✓LIGHTING ✓IGNITION ✓BATTERIES

NEW FISHING VESSELS FOR THE WEST COAST

EVIDENCE of the growing trend toward Diesels for small fishing vessels is exemplified by the installation of a Cummins 150 hp. marine Diesel in the jig boat *Alamo,* recent addition to the Southern California mackerel fleet, designed and built by the Harbor Boat Building Co., Terminal Island, California, for Pete Houssels of the Van Camp Sea Food Co. Driving energy is applied to a Collidge 28 in. wheel through a Twin-Disk 2:1 reduction gear giving an estimated speed of ten knots with a fare of ten tons.

Of the raised deck type, excellent lines carry out well her dimensions of 42 ft. o.a. and ample beam of 12 ft. Equipment includes Fairbanks-Morse pumps and a ¾ kw. generating set. The fuel capacity is 650 gals. She is in charge of Captain Al Beckman and Mate O. Bakke.

ANOTHER Atlas Diesel engined "baby clipper" is beginning to take form at the Al Larsen Boat Works, Terminal Island, California, making the second in several months. Designed by N. A. Adolph Larsen for Agustine Ghio and the Van Camp Sea Food Co., the boat is 70 by 20 by 9 ft.; main engine an Atlas Diesel of 220 hp.; auxiliaries are two Cummins Diesel generating sets; has two Vilter ice machines; and carrying capacity of 95 tons. Wheel is a Pitchometer of 60 in. diameter. Completion is expected by March. She will be named the *North America.*

ADDING to the rapidly growing fleet of small tuna clippers, J. G. Romero of San Diego, California, is building for Frank Medina a 75 by 19:6 by 9:6 ft. "baby" powered with a six cylinder 200 hp. Fairbanks-Morse direct reversible main Diesel, and two 65 hp. Caterpillar marine Diesel auxiliaries directly connected to generating sets supplying current for refrigeration, bait pumps, etc. Cargo capacity is 90 tons. Accommodations are for a crew of nine. Galley, located in the after end of deck house, has an Ingle oil range.

COMPLETING one of its most successful years, the Campbell Machine Co., of San Diego, California, has delivered a 68 ft. "baby" tuna clipper to Rocco Parmigiani and associates. Powered with a 176 hp. direct reversible, 6 cyl. Union Diesel, and Union auxiliaries of 20 and 30 hp. The vessel has a beam of 18 ft. 6 in., and a depth of 8 ft. 9 in.; pilot house is topside, unusual for a craft of this size, and the crew of nine are berthed in the main deck-house. Refrigeration is crushed ice supplied by a 4″ x 4″ machine of their own type.

THE *St. George,* 102 ft. tuna boat, nearing completion at Harbor Boat Building Co., Terminal Island, California, will have a complete Fairbanks-Morse power lay-out. Main driving unit, a 300 hp. 2 cycle 8 cylinder Diesel with pump scavenging; three auxiliary Diesels, two 120 hp., and one 40 hp.; all pumps and electric motors.

Vilter ice machines are part of the refrigeration set-up by Gay Engineering Corp., in charge of Ralph Manns.

Designed by Milo Rados, brother of John Rados, president of the company, the vessel at its preliminary launching, was in charge of H. W. Brown, district manager for Fairbanks-Morse, as master of ceremonies.

ANOTHER SUCCESS STORY

Fluid Drive (Hydraulic Coupling) Surpasses All Expectations on First Voyage of Motorship Sea Witch

American Pioneer Line's new Motorship SEA WITCH has completed its first voyage with flying colors . . . 27,500 nautical miles in about 81 sea days—New York to the Orient and return. American Blower Fluid Drive (Hydraulic Coupling) played an important part in the smooth performance and remarkable maneuverability of this Diesel-powered ship. That the enthusiasm of the ship's operating staff is shared by men who know, buy and build motorships, everywhere, is evidenced by the rapidly increasing number of ships being equipped with Fluid Drive. The trend is to Fluid Drive!

Fluid Drive

(HYDRAULIC COUPLING)

If you are interested in space saving, weight saving, greater maneuverability and smoother operation for motorships—get the facts on Fluid Drive (Hydraulic Coupling). Also ideal for direct attached scavenging blowers, variable speed auxiliary drive, etc. Phone or write the nearest American Blower branch office today for complete data.

AMERICAN BLOWER CORP.

HYDRAULIC COUPLING DIVISION, 6000 Russell St., Detroit, Mich.
New York: 50 W. 40th St., Room 402 • In Canada: Canadian Sirocco Co., Ltd.

OPERATING AND SUPERVISING ENGINEERS' SECTION

. . . . *Continued from page 40* . . . .

We believe this to be true, and particularly true in the engineering profession. It has also been said that "The heart of any industrial plant is its power plant." It might also be said that "The heart of any community is its source of power," since this source plays a vital part in our national life and way of living today.

We are facing today the greatest crisis in our history in the preparation for National Defense and, in every community in this vast nation, the effects of this preparation are beginning to be felt. Therefore, we who have charge of equipment which is the heart of this nation are all fully cognizant of the strain which is being put upon this heart, whether it be in industry, in business, in the factory, or in the home, since they are all dependent upon the power plant and its source of power to meet the demands placed upon it.

With this increasing demand, many of us are faced with increasing problems. The capacity of our plant may be taxed to the utmost to keep uninterrupted service to the community, or those depending upon us. Ofttimes these problems seem complicated and require a lot of thought, and we would appreciate the opportunity of getting the ideas of others on some particular problem with which you, as operating engineers have been faced, and what methods you have pursued in solving that problem.

CORRECTION, PLEASE

THE pair of Superior Diesel propulsion engines in the yacht *From Now On,* described in the January issue of DIESEL PROGRESS, are Model MRD-8, eight cylinder, 5½" x 7", rated 230 hp. each at 1500 rpm., instead of the heavy duty type Superior engines mentioned, concerning which our comments were in error.

OF the seven yards bidding on this part of the Maritime Commission's program, Seattle-Tacoma Shipbuilding Co., Seattle; Federal Shipbuilding & Dry Dock Co., Kearny, N. J.; Tampa Shipbuilding Co., Tampa, Fla.; and Western Pipe & Steel Company, San Francisco, all bid on Diesel ships in addition to steam ships, and the price differentials were well within working limits. It is hoped that at least six of the eight C-2 vessels to be built under this new program will be Diesel-equipped.

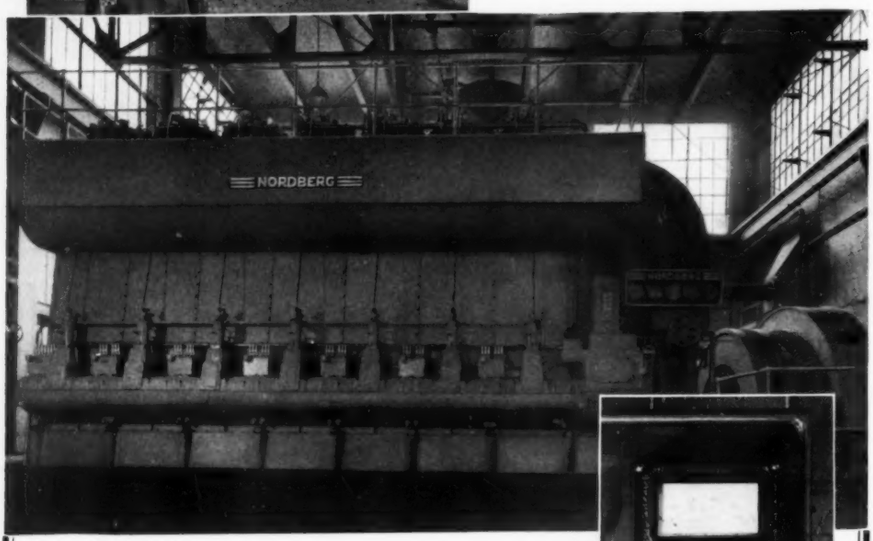
Electrical R.P.M. Indication meets EVERY qualification "on the nose"

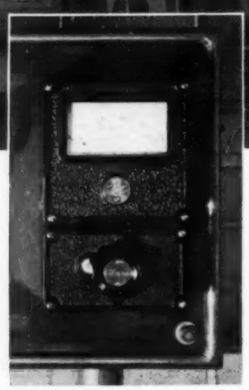
Electrical R.P.M. Indication means efficiency and economy *all the way.* Installation involves nothing more than a wired connection between the magneto and indicator. *No fitting or aligning of mechanical parts.* This simplicity, too, assures long, trouble-free operation. And in service, under all conditions, the pointer indications always are accurate and easy-to-read; for the "magneto-indicator" relation is unvaryingly proportional, and the pointer responds to all changes *smoothly* . . . without jumping or flickering. Let us send you *all* the facts, acquaint you with *all* the advantages of *proved* electrical indication. Write to Weston Electrical Instrument Corporation, 579 Frelinghuysen Ave., Newark, New Jersey.

WESTON Indicators are available in various sizes and shapes, with scales calibrated in any range of R.P.M.

WESTON *Instruments*

South Norwalk Electric Works, South Norwalk, Connecticut, serving the Second Taxing District of the City of Norwalk, became one of the largest Diesel electric generating plants in the East with the installation of this 3,000 hp. Nordberg Diesel engine.





Alnor Multi-Point Exhaust Pyrometer Serving the New Nordberg Diesel

South Norwalk Municipal Light Plant has an unbroken success record of 49 years. Diesel prime movers have been employed in this plant since 1905 which ranks it as one of the oldest Diesel plants in the country.

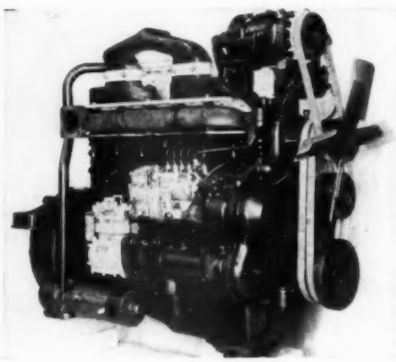
The 3,000 hp., seven cylinder, 21" x 31", Nordberg Diesel and its accessories, of which the wall-mounted Alnor Exhaust Pyrometer is typical, represent the most modern achievements in design and arrangement. The selection of an Alnor Pyrometer to stand guard over this large engine is a tribute to the quality and dependability inherent in Alnor design and construction. By far the majority of new Diesel installations go in with Alnor Pyrometers.

Specify and Buy Alnor
Write for Catalog

Illinois Testing Laboratories Inc.
Don't Guess Know!
423 NORTH LaSALLE STREET, CHICAGO, ILLINOIS
Manufacturers of "Alnor" and Price Instruments—Products of 41 Years' Experience

MACK ROUNDS OUT ITS LINE OF DIESEL ENGINES WITH A NEW SMALLER MODEL

JUST placed in production by Mack Trucks, Inc., to round out its full line of Diesel engines for 1941, is the new model END-405 Mack-Lanova Diesel, a smaller edition of the remarkably successful model ED Mack-Lanova Diesel and the recently announced model END-605.



Designed for installation in four-wheel truck models of the 24,000-26,000 lb. Gross Vehicle Weight range, this new Mack Diesel is a marvel of efficiency and economy. Having a piston displacement of 405 cu. in. and bore and stroke of 4" x 5-3/8", this engine operates at the maximum governed speed of 2200 rpm. and develops 107 hp. at that speed. Maximum torque at 1200 rpm. is 308 lb. ft.

The new model END-405, as do all Mack Diesels, employs the well-known Lanova system of controlled combustion and develops exceptionally high power and economy while operating at moderate compression and fuel injection pressure, resulting in exceptional smoothness of operation and durability which hitherto have never been attained in automotive Diesel engines.

Cylinders and crankcase are cast in block with removable dry cylinder sleeves. The two detachable cylinder heads are held down by thirty-two studs. Overhead valves are operated by pushrods and rockerarms and double concentric valve springs. Injection equipment consists of a flange-mounted American Bosch multiple-unit injection pump with an integral governor on one end and pintle-type nozzles.

Seven main bearings of the precision thin-shell type with copper lead lining support the 147-lb. pack-carburized and case-hardened crankshaft which is fully counterbalanced with

twelve counterweights forged integral. Crankpins are of unusually large size and bored out for lightness and better cooling of connecting rod bearings. By using a 35-degree cap angle, the connecting rods have been adopted to be withdrawn through the cylinders without disturbing the main bearings. Like the crankshaft, the camshaft runs in seven large bearings.

All lubrication passages are rifle-drilled out of the solid iron, no tubes or piping of any kind being used. Oil is fed under fixed pressure to all main and camshaft bearings, the connecting rods, valve rocker shafts, air compressor and governor and is effectively cooled by the full-length water jackets and the flat top of the crankcase, at the bottom of the jacket. The oil filter is built onto the crankcase and uses no external connections.

Aside from the water pump, fan, and generator, which are driven by the conventional triangular double V-belt, all timing and accessory drive is through a train of helical gears which are upset, end-grain drop-forgings, case-hardened and generator ground. Mack's exclusive cold-circulation thermostatic system of temperature control is used in connection with a thermostat and directed water flow.

GOVERNMENT ORDER TO ENTERPRISE

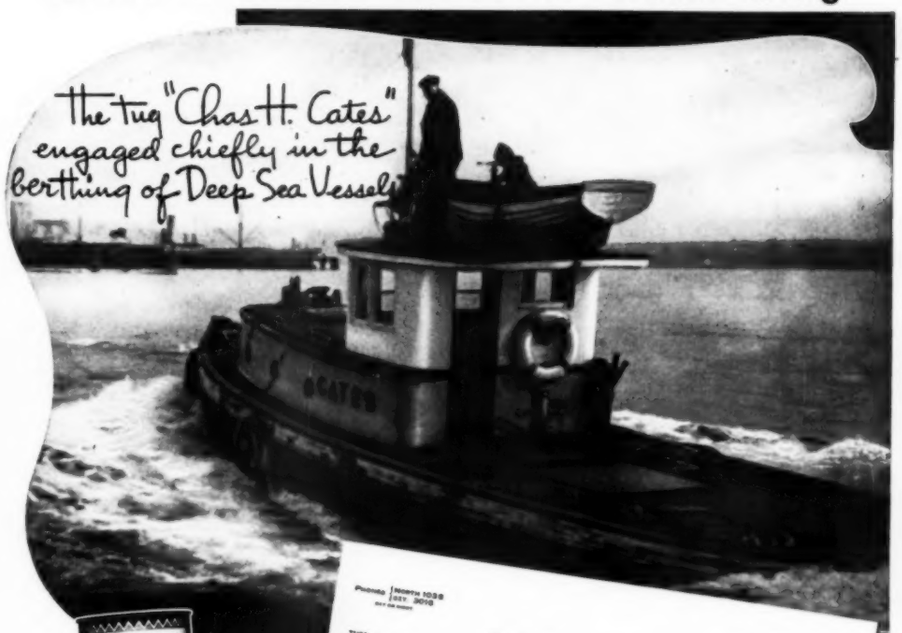
C. G. COX, sales manager of Enterprise Engine & Foundry Company, announces that the United States Government has ordered three Enterprise 1000 hp. Convertible Gas Diesel engines for the power plant at Fort Huachuaca, Arizona.

These 8-cylinder engines, equipped with 700 kw. generators, will augment the 6-cylinder, 750 horsepower Enterprise engine of similar design installed last year. The new engines will replace some of the earliest Diesel engines built in this country twenty-six years ago.

TWO new Diesel tugboats have been contracted for by the Southern Towboat Company, Mobile, Alabama, from the Alabama Dry Dock & Shipbuilding Co. of the same city. The vessels will measure 104 ft. x 24 ft. x 14 ft. with 289 gross tons.

LEVINGSTON Shipbuilding Co., Orange, Texas, is now building a 74 ft. tugboat which is to be equipped with 400 hp. Diesel engines. This tug is for a stock account and the dimensions are 74 ft. x 20 ft. x 13 ft. 3 in.

"Never a Stuck Valve or Stuck Ring"



RISLONE is available in one, and one-half quart cans, and 5, 15, 30 and 50 gallon drums. Use it with regular lubricating oil. The only product of its kind having Diesel engine builders approval.

C. H. Cates & Sons Limited
HARBOUR TOWING & SCOWS
NORTH VANCOUVER, B.C.

The Shaler Co. Ltd.
Toronto, Canada

July 16, 1940

Gentlemen:

Having used your Shaler Rislone for the last three years, we thought you would like a report on its performance.

We have one Vivian Diesel engine of fifty-two H.P., one Vivian Diesel of 160 H.P., both 4 cycle engines, also one Fairbanks Diesel 35 H.P., one Fairbanks Diesel 45 H.P., one Fairbanks 45 H.P. semi-Diesel, one 100 H.P., Fairbanks semi-Diesel.

We can not give a comparison with the Vivians without Rislone, as we have used it from the time when engines were new. However, in comparison with other engines of the same make, the results are very marked. We have never had a stuck valve or a stuck ring, in the 4 cycle engines. After 2500 hrs. of full power operation, we had the pistons out of the 160 H.P. Vivian and found all the rings free and the pistons not even dirty. We have never had to tighten a bearing in either engine through wear.

In the 2 cycle engines, we have had a much better comparison. As our engines are in tugs they are very often overloaded and this caused the exhaust ports to plug with carbon. We tried putting Rislone in our oil without cleaning the exhaust ports. In six weeks time we examined them and found the carbon had all disappeared. We now never touch our exhaust ports.

We also had trouble getting oil to the exhaust side of the pistons. Whereas before using Rislone they were dry, now they are well oiled. We have had no bearing trouble whatever with these engine bearings. I remain

Yours very truly,

C. H. Cates & Sons Ltd.

per Charles H. Cates

C. H. Cates & Sons Ltd., one of the outstanding companies engaged in the towing business in Northwest Vancouver states that RISLONE has cured their problem of stuck rings and valves in their Diesel engines. Read their letter reproduced above.

Rislone, a combination of little known chemicals acts as a solvent to dissolve all types of gums that form in ring grooves and on valve stems. RISLONE'S high capillary attraction assures adequate lubrication to all moving parts, facilitates easy starting and by dissolving the gums which come from all oils and Diesel fuels, permits longer runs before overhauls. RISLONE lowers maintenance costs,—use it with your regular lubricating oil. . . Where special Diesel oils are used, RISLONE will further reduce gum and carbon formations. If you are having ring or valve trouble — let RISLONE rid your engines of these problems. THE SHALER CO., Waupun, Wis.

FREE
Write for NEW Booklet
"ENGINE
PERFORMANCE"

RISLONE

NATIONAL SUPPLY APPOINTS

THE National Supply Company recently announced the appointment of Fred R. Lowell as its Manager of engine sales.

Mr. Lowell has been affiliated with The National Supply organization since April, 1936, when he assumed charge of the company's Commercial engine sales in the Southwest with headquarters at Houston, Texas. In January, 1940, he was transferred to Springfield, Ohio, to become Manager of Oil Field engine sales and occupied this position at the time of his present appointment.

Following his graduation from the University of Wisconsin in Engineering in 1926, Mr. Lowell associated with the Engineering Department of Fairbanks Morse & Company. In 1928, he joined the engine sales staff at the Chicago office and in June, 1933, became Fairbanks' representative to the Philippine Islands in charge of Sales and Service of all the Company's products.

In June, 1933, he was made Manager of Export Division Machinery Department of Fairbanks-

Fred R. Lowell

Morse with headquarters in New York. Mr. Lowell resigned this position in April, 1936, to join National's sales staff.

SUMMARY of Bids Received January 7, 1941, for the Construction of a 65-Ft. Coast Guard Cutter for the Columbia and Snake Rivers:

BIDDER	PRICE
Birchfield Boiler, Inc., Tacoma, Washington.	$ 65,650.00
Astoria Marine Construction Company, Astoria, Oregon.	78,725.00
Albina Engine & Machine Works, Inc., Portland, Oregon.	79,645.00
Berkeley Steel Construction Co., Inc., Berkeley, California.	102,500.00

The Birchfield Boiler, Inc., was awarded the contract for this Cutter on January 10, 1941.

STAYNEW FILTER CORP. ANNOUNCES NEW WATER FILTER

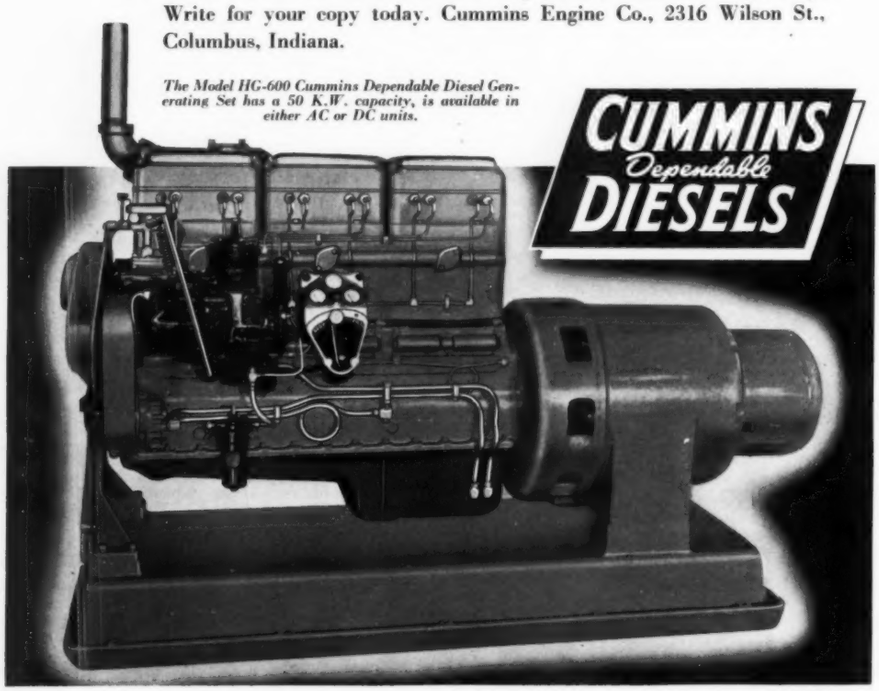
MANY engineers will be interested to learn that the well-known "Radial Fin Construction", successfully used by Staynew Filter Corp. in more than half a million filters for air transmission lines and internal combustion engines, has now been adapted in a new model to the filtration of water. The new filter known as the Model CPHLS for Water Filtration, has already proven its value, under actual working conditions.

Construction is simple and filtering action positive—all water passing through special fabric filter mediums possessing the advantages of high efficiency plus minimum restriction a-

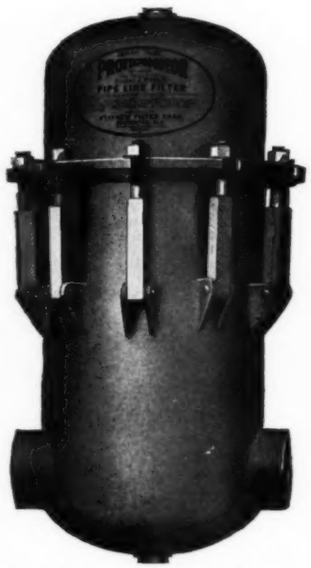
COULD A STORM BLACK OUT YOUR FACTORY?

Is your plant equipped to maintain production, even if flood or storm strikes suddenly and disrupts your present power supply? Farsighted businessmen and public officials . . . operators of factories, hospitals, department stores, apartment houses and municipal power plants . . . are protecting production and property—even lives—against tomorrow's possible power failure by installing Cummins Dependable Diesels for standby service. Cummins Diesel power assures you of power and light in any emergency on split-second notice because Cummins Diesel power is always available at the touch of a button . . . instant starting . . . dependable. The new Industrial Catalog contains complete information about the entire line of Cummins Dependable Diesels, 33 to 500 hp. Write for your copy today. Cummins Engine Co., 2316 Wilson St., Columbus, Indiana.

The Model HG-600 Cummins Dependable Diesel Generating Set has a 50 K.W. capacity, is available in either AC or DC units.



water flow—advantages which are increased by the Radial Fin Construction. This construction permits a large area of filtering medium to



Outside View of the Model CPHLS Protectomotor

occupy a relatively small space. For example. a Radial Fin Construction Insert only 11 inches high by 8¼ inches in diameter possesses an active filtering area of 1325 square inches.

Cross-section of Radial Fin Construction Insert

There are no moving parts in the new filter, and the large filtering area permits long periods of operation without any attention whatever. When necessary, the entire insert can be easily removed by merely unbolting the head and removing one wing nut. The units can be arranged so that cleaning is effected by backwashing with clean water.

Lightness and compactness are also important advantages of the new filter when space is limited, or overhead locations are required.

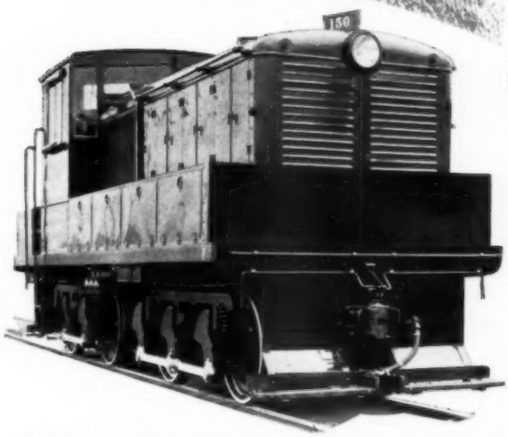
CHARLES B. JAHNKE BECOMES COOPER-BESSEMER PRESIDENT

THE resignation of B. B. Williams as president of The Cooper-Bessemer Corporation, and election of Charles B. Jahnke as his successor was announced Saturday, December 28, following a meeting of the corporation's board of directors in Mount Vernon, Ohio, on the previous Friday afternoon.

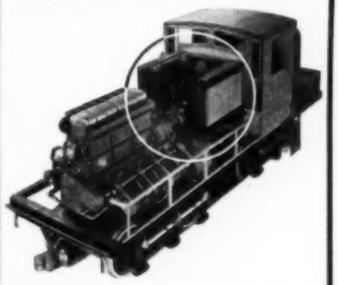
Mr. Williams was made chairman of the board of directors, succeeding Dr. E. J. Fithian of Grove City, Pennsylvania, who resigned his position. The new chairman expects to continue in an active capacity as the head of the corporation. Mr. Jahnke, who has been vice-president and general manager for the past two-and-a-half years, will act as president and general manager and will serve as a member of the executive committee. Dr. Fithian, one of the founders of the Bessemer Gas Engine Company, and its president for several years, will continue as a member of the board of directors.

Mr. Williams had considered resigning the presidency and nominating Jahnke as his successor at the corporation's annual meeting in March, but decided to act now because of the importance of national defense work being

What's Your Problem
IN DIESEL ENGINE COOLING?



PRODUCT OF Young
ENGINEERING AND MANUFACTURING SERVICE
SPECIALIZING IN HEAT TRANSFER PRODUCTS



HEAVY DUTY RADIATORS
Proper air delivery against resistances, high heat transfer capacity, rugged strength, stamina, and clean cut appearance . . . all are combined in Young Heavy Duty Radiators.

IN Diesel cooling systems where absolute dependability and high cooling efficiency is demanded, Young engineering is playing an increasingly important role. That's why the General Machinery Corporation, Hamilton, Ohio, has selected Young cooling systems for its Diesel locomotives. Young High Efficiency cooling is the result of careful research, controlled production, and a thorough knowledge of cooling requirements for all types of internal combustion engines. You, too, can benefit by placing your cooling problems before us. Write today for information.

YOUNG RADIATOR CO., Dept. 231-B, RACINE, WIS., U. S. A.
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Happy Belting Co., Tulsa, Okla.
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A FEW OF MANY WELL KNOWN USERS OF YOUNG PRODUCTS
American Locomotive Co.
Baldwin Locomotive Works
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Young
High Efficiency
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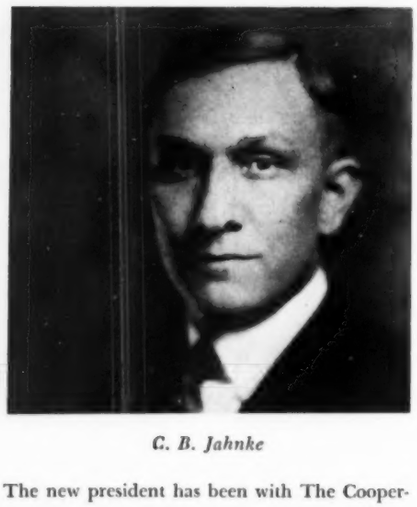
OIL COOLERS • GAS, GASOLINE, DIESEL ENGINE COOLING RADIATORS • INTERCOOLERS • HEAT EXCHANGERS • ENGINE JACKET WATER COOLERS

done by Cooper-Bessemer and the necessity of his being absent often from the company's main offices.



C. B. Jahnke

The new president has been with The Cooper-Bessemer Corporation since 1935, having served two-and-a-half years as chief engineer and since July 1937, as vice-president and general manager. He came to Cooper-Bessemer as a Diesel engineer, with an extensive background and training in engineering work with that type of engine.

Reared at Cincinnati, Mr. Jahnke was graduated from the University of Cincinnati in 1910 and then worked for twenty-one years with Fairbanks, Morse & Company, at Beloit, Wisconsin, first as chief engineer and then as works manager of the Beloit plant. He later served as director of engineering after the Fairbanks-Morse management was changed to concentrate all activities of the company at Beloit. In 1931, he went to Chicago to join the International Harvester Company in its program of developing Diesel engines for farm machinery. Four years later he became affiliated with Cooper-Bessemer at Mount Vernon.

Mr. Williams, the retiring president, has been with The Cooper-Bessemer Corporation and its predecessor, the C. & G. Cooper Company, for forty years. In 1900, he joined the Cooper Company as a sales engineer, and was made secretary in 1912. Four years later he became vice-president and general manager, and in 1920 was elected president, a position he retained when the Cooper Company was merged with Bessemer in 1929 to form the present corporation.

In becoming chairman of the board, Mr. Williams does not intend to retire into an inactive capacity, but plans to retain an active voice in the company's affairs and especially in shaping its broad policies, while turning over to the new president the actual administrative and organization work, along with the executive powers of the presidency.

NEW YORK CENTRAL PURCHASES

MR. F. E. Williams, president of the New York Central System, announces the purchase of 95 passenger coaches, 36 Diesel-electric switching locomotives, and 2,000 box cars for approximately $12,500,000.

ARTHUR C. HOUSER

ARTHUR C. Houser, 52, manager for the past eight years of the Washington office of the General Motors Diesel Engine Division in Cleveland, died suddenly December 18.

In the early days of his career, Mr. Houser was employed by the Buffalo Gas Engine Company for twenty years, and, in 1925, he moved to New York City at which time he became salesman for the old Winton Engine Corporation which was later purchased by General Motors Corporation. He had been located in Washington since 1933 and was a member of the Congressional Country Club here.

NOTICE OF AWARD BY UNITED STATES COAST GUARD

THE bid of the Marine Iron & Shipbuilding Co., Duluth, Minnesota, in the amount of $673,299.00, for the construction of one Cutter of the *Cactus* type, was accepted on December 31, 1940.

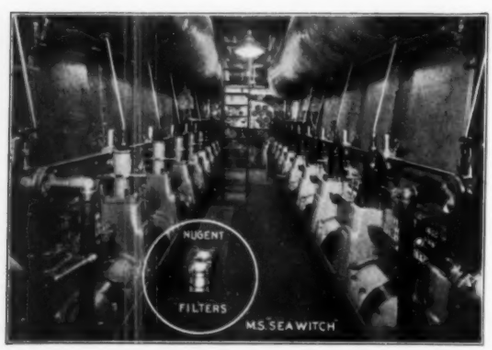
The bid of the Toledo Shipbuilding Co., Inc., Toledo, Ohio, in the amount of $1,129,000.00 for the construction of one 200-ft. Coast Guard Cutter, was also accepted on December 31, 1940.

THE following private vessels have been purchased by the Navy Department:

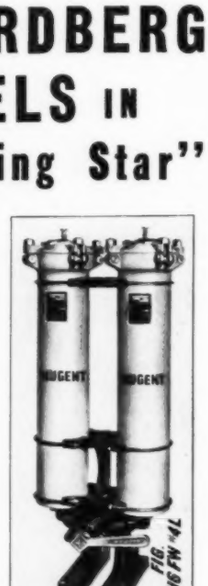
Diesel Tugboat *John E. Matton*, 113 gross, 9[illegible] net tons, from John E. Matton & Sons for $100,000. This tugboat was built at Cohoes, New York, in 1939.

Yacht *Nakhoda*, 958 gross, 428 net, from Burth[illegible] M. Fisher, Detroit, Michigan, for $155,000. This yacht was built at Wilmington, Delaware, in 1930.

NUGENT FILTERS ON NORDBERG DIESELS IN "Shooting Star"



LEFT: View of engine room aboard the M.S. "SEA WITCH," sister ship of the "SHOOTING STAR," both of which are powered by two Nordberg Diesels. Note location of Nugent Duplex Filter. RIGHT: Close-up of typical Nugent Duplex Filter unit.



The "SHOOTING STAR," one of the latest motorships to enter U. S. Navy service, is powered with two Nordberg Diesels. Positive protection against "Dirt Troubles" is secured through the use of two Nugent Duplex Filters.

The Nugent Duplex Filter is *not* just an ordinary filter. It's a specially designed, patented unit built to meet the demands of Diesel operators who can't take a chance on power interruptions. The Duplex construction makes it easy to maintain continuous protection year after year.

It is important to note that Nugent Filters will not remove any of the additives which are being widely used in Diesel engine lubricating oils. We will be glad to send you complete information covering the selection and use of Nugent Filters for fuel or lubricating oil. *Ask for Bulletin 7A.*

NUGENT Patented Pressure Filters have 20 TIMES MORE ACTUAL FILTERING AREA than most filters of comparable size. Nugent's special woven, acid resisting, lintless textile filter element removes particles as small as .0003" to produce 99-8/10% clean oil. In asking for quotations, please mention gals. per min. circulated and viscosity of oil at operating temperature.

NUGENT TRADE MARK

Wm. W. Nugent & Co., Inc. Mfrs.

Oil Filters, Oiling and Filtering Systems, Telescopic Oilers, Oiling Devices
Sight Feed Valves, Flow Indicators, Compression Union Fittings, Oil Pumps, Etc.

N. HERMITAGE AVE. Established 1897 CHICAGO, U. S. A.

Diesel Trawler *Trimount* from Massachusetts Trawling Corporation for $126,000.

Diesel propelled Ferryboat *Madisonville*, 141 tons, from Charles B. Sutton, Jersey City, N. J., for $60,000. This ferryboat was built at Madisonville, Louisiana, in 1927.

NEW BRANCH FACTORY

AMERICAN Bosch Corporation, Springfield, Mass., today announced that a branch factory is being established in Providence, R. I., to accommodate a heavy increase in business as well as to provide separate and parallel manufacturing facilities for certain products used on National Defense equipment.

The Providence plant of American Bosch will be located on Chapman Street in the modern four-story building formerly occupied by the Ceco Manufacturing Company. According to present plans approximately 500 people will be employed in this plant which will go into operation as soon as the considerable amount of equipment required can be installed.

FROM GASOLINE TO DIESEL

Fairbanks-Morse recently sold a 4-cylinder, 8¾" bore, 10½" stroke Marine Diesel engine rated 120 hp. at 450 rpm. for the fishing vessel *Two Brothers*. This is a converted yacht which was formerly known as the *Pocomo* and was powered with a gasoline engine.

The new Diesel engine is being installed in the *Two Brothers* at the yard of the Hitchcock Gas Engine Company, Bridgeport, Connecticut, and the boat will operate out of Stonington, Connecticut.

A CONTRACT has been awarded to the St. Louis Shipbuilding & Steel Co. by the Commercial Barge Lines for the construction of a 100 ft. x 26 ft. x 8½ ft. towboat with 210 gross tons. The motive power will be supplied by a 490 hp. Diesel engine.

THE U. S. Engineer Office in Philadelphia is now working on plans and specifications for a 45 ft. Diesel work launch for the Rock Island District. The Chief of Engineers has also received authorization for the design and construction of a 65 ft. Diesel harbor tug to be used at the Soo Locks by the Detroit District.

Stationary Diesels
Marine Diesels
Diesel Locomotives
Diesel Auxiliaries
For Dependable Diesel Starting
AND OTHER SERVICES
Specify QUINCY COMPRESSORS
Hundreds of Diesel installations on land and sea have proved the dependability of Quincy Compressors for starting and other services. Modern design and new operating features assure outstanding over-all efficiency. Radiation is 12% greater. Lubrication is more thorough — more positive. Designed for Starting Service requiring intermittent pressures up to 500 lbs. per sq. inch. Available with either gas engine or electric drive or a combination of both. Remember! Specify Quincy for dependable Diesel Starting Service!
Quincy Features — 1. Timken Roller Bearings. 2. Semi-Steel Pistons. 3. Perfectly Balanced Crankshaft. 4. Cushioned Steel Valves. 5. Lynite Rods. 6. Constant Level Oiling. 7. Improved Cooling. 8. Nickel Chrome Castings.
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Branch Offices:
New York St. Louis Chicago Cleveland San Francisco
GET NEW FREE BOOK
Contains Complete Information on Quincy Compressors for Diesel Starting and other Service. Write today!
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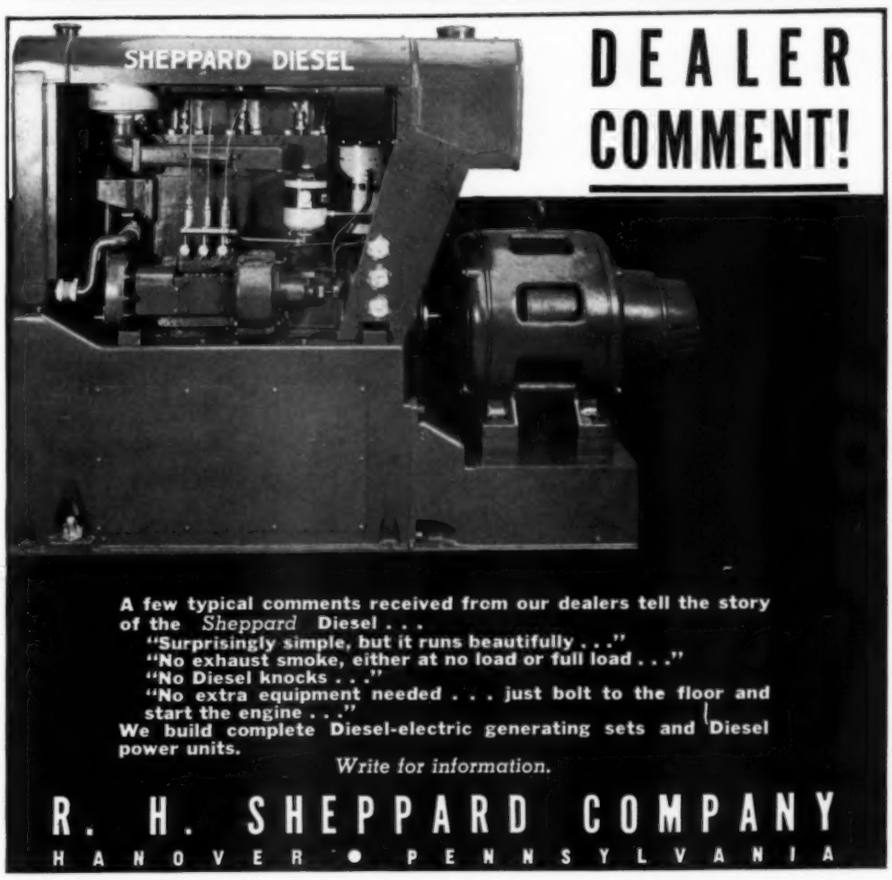
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DEALER COMMENT!
A few typical comments received from our dealers tell the story of the Sheppard Diesel . . .
"Surprisingly simple, but it runs beautifully . . ."
"No exhaust smoke, either at no load or full load . . ."
"No Diesel knocks . . ."
"No extra equipment needed . . . just bolt to the floor and start the engine . . ."
We build complete Diesel-electric generating sets and Diesel power units.
Write for information.
R. H. SHEPPARD COMPANY
HANOVER • PENNSYLVANIA

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Diesel Engine Design and Development

IF you are developing a new design of a higher speed, light weight Diesel engine of greater power capacity for Navy, marine, tanks, trucks, tractors, or aircraft application, our service will be helpful to you.

If you have operating difficulties or are not satisfied with your Diesel engines, whether it refers to combustion, bearings, pistons, scavenging, supercharging or any other parts or problems, consult us.

Our Mr. Heinrich Schneider has greatly improved entire lines of Diesel engines, and designed and developed new types of engines for several of the largest and best known Diesel manufacturers in the country.

Schneider Brothers Corporation
Forest Hills Hamilton, Ohio

Day AND *Night* YOUR
CRANE continuous REFINER
IS ON THE JOB!

The only practical and economical way to secure a constant supply of bright, fresh oil and a perfectly clean engine, always, is to equip it with a CRANE REFINER, which functions continuously -- while the engine operates.

You get GUARANTEED PERFORMANCE with a Crane!

By all means you should study our Bulletin 100 L

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Investigate TODAY

HONAN-CRANE CORP.
Factory and General Office
LEBANON, INDIANA

ARTHUR G. GRIESE

THE death of Arthur G. Griese on December 21 was indeed a deep shock. He was fifty years old and was the founder and president of the Industrial Chemical Development Corporation, a chemical manufacturing firm located at 331 Madison Avenue, New York.

Mr. Griese was well known throughout the Diesel industry because of his close association with the old Winton Engine Company and later with the General Motors Diesel Division. He served as a lieutenant in the United States Army in France during the World War and was a member of the American Legion and the Institute of Naval Architects and Marine Engineers.

SEVEN shipyards have sent bids to the U. S. Maritime Commission on Diesel or steam-propelled vessels. When the awards are made, there will be a total of 190 ships building for the Government. These bids cover the construction of eight C-2 type cargo vessels.

EVAPORATIVE COOLERS

Announcement of a new line of evaporative closed system water coolers for Diesel engines by Fairbanks, Morse & Company comes in the form of its bulletin F E C D. This is a two-color, sixteen page booklet with illustrations, construction data, dimensional drawings, and complete ratings of evaporative coolers for engines up to 1750 hp. and for both indoor and outdoor operation. Readers of DIESEL PROGRESS who are interested may secure their copy of Bulletin F E C D by writing to Fairbanks, Morse & Company, 600 South Michigan Blvd., Chicago, Illinois.

BIDS were received on January 9 by the U. S. Maritime Commission for the construction of five Diesel-equipped small gasoline tankers for the Navy Department. Three shipyards quoted on this requisition of which Albina Engine & Machine Works, Inc., Portland, Oregon, was the low bidder. The other two shipyards were Pusey & Jones Corp., Wilmington, Delaware, and Seattle-Tacoma Shipbuilding Corp., Seattle, Washington.

These vessels are to be 2,300 deadweight tons, twin screw, Diesel equipped, and will be 300 feet 6 inches overall with a designed speed of fourteen knots.

IMPROVED NORDBERG DIESEL

MORE compact, with greater power, simplified construction and better appearance, coupled with high efficiency and characteristic dependability and reliability, an improved two-cycle Diesel type is now offered by Nordberg Manufacturing Company.

More power is obtained in less space and without sacrifice of accessibility which is most important to good operation. By the removal of large aluminum covers on the exhaust side of the engine, convenient and easy access to the crankcase is obtained. Fuel injection pumps are mounted directly above a full length camshaft thus bringing each fuel pump adjacent to the cylinder it serves, and all at a convenient height for servicing from the floor. A fuel pump may be removed or replaced without shutting the engine down. Fuel injection lines are of the same length, short and direct.

A Woodward governor is used as standard equipment. The power cylinder lubricators are placed alongside the fuel pumps and gear driven from the camshaft. Each lubricator is of six feeds and timed to feed the lubricant into upper part of the cylinder while the piston is at a predetermined position of its stroke. Better lubrication means less wear of cylinder parts.

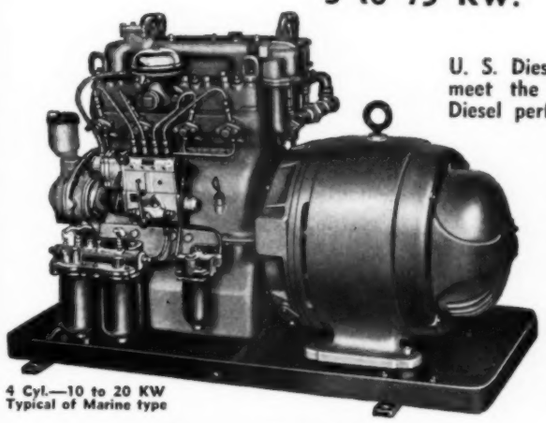
A single, positive displacement Roots-Connersville, two lobe blower, gear driven from the crankshaft is used for supplying the scavenging air in the larger models, while reciprocating pumps are used on the smaller sizes.

Arranged for either air or mechanical injection of the fuel and constructed with crossheads or trunk pistons, these engines represent the latest in proven design. Important, too, is the fact that all models may be equipped for burning natural gas and the change over from oil fuel to natural gas burning may be accomplished quickly without change of major parts and without departing from the Diesel operating cycle.

The improved Nordberg Diesels are available in sizes from 750 horsepower upward.

JAKOBSON Shipyard, Oyster Bay, L. I., is now building a new Diesel tugboat for the Dauntless Towing Company. The new tug will be 107 ft. in length, beam 25 ft., and depth 13 ft. 8 in., with 255 gross tons. The Diesel engine will be rated at 1400 horsepower.

"U.S." DIESEL
ELECTRIC PLANTS
3 to 75 KW.



4 Cyl.—10 to 20 KW
Typical of Marine type

U. S. Diesel Electric Plants are built to meet the highest standards of modern Diesel performance. Safety . . . smooth running . . . easy starting . . . and economical operation — are the *plus values* which you get in a U. S. Diesel Electric Plant. One, two, four and six cylinder models. 3 to 75 KW. Complete lines for both marine and land service. Write for full information.

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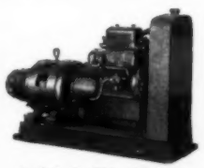
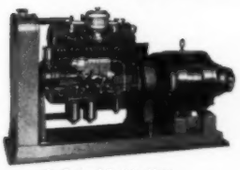
Oshkosh, Wis.



2 Cyl. 5, 7½, 10 KW.



6 Cyl. 25-60 KW.

75 KW.

VELVET SMOOTH AT EVERY SPEED
SILENT DIESEL-TYPE ENGINES with 'Hydraulic Drive' ARE FEATURES OF THE 'ILLINI'
CHAMPAIGN-CHICAGO
Susquehanna
Streamliners
VELVET SMOOTH AT EVERY SPEED
SILENT DIESEL-TYPE ENGINES with 'Hydraulic Drive' ARE FEATURES OF THE 'MISS LOU'
Jackson-New Orleans

● Greater passenger comfort and convenience . . . faster schedules . . . maximum operating economy . . . these are the reasons why new diesel-powered rail cars are equipped with Twin Disc Hydraulic Torque Converters. The Torque Converter eliminates jars and jerks from starts . . . provides smooth, quick acceleration and a rapid, effortless shift into direct drive for top speed. Write for Bulletin No. 119-A for complete description.

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CLUTCHES AND HYDRAULIC DRIVES
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TWIN DISC CLUTCH COMPANY • 1345 RACINE STREET • RACINE, WISCONSIN

BLOOD POISONING

DEATH TO MAN OR ENGINE

Protect the blood stream of your engine — the vital lubricating system — with a Briggs Oil Clarifier, the only lube oil maintenance equipment using a moulded BLOCK of FULLERS EARTH.

Write for information regarding your clarification problems.

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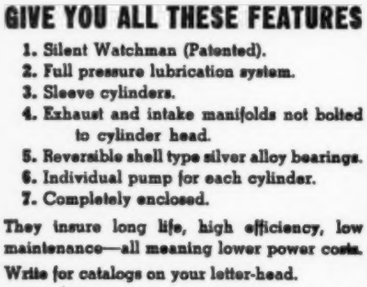
3262 K ST. N.W. WASHINGTON, D.C., U.S.A.

Steelbestos TWIN TYPE GASKETS
DIESEL Absolutely HOLDS WATER, OIL, AND COMPRESSION. COMPRESSES TO 1/16 IN.
DETROIT GASKET AND MFG. CO. · DETROIT

ONLY BUCKEYE DIESELS



GIVE YOU ALL THESE FEATURES

1. Silent Watchman (Patented).
2. Full pressure lubrication system.
3. Sleeve cylinders.
4. Exhaust and intake manifolds not bolted to cylinder head.
5. Reversible shell type silver alloy bearings.
6. Individual pump for each cylinder.
7. Completely enclosed.

They insure long life, high efficiency, low maintenance—all meaning lower power costs.

Write for catalogs on your letter-head.

The Buckeye Machine Co.
Lima, Ohio
Engine Builders Since 1906

Latest Diesel Patents

A description of the outstanding patented inventions on Diesel and Diesel accessories as they are granted by the United States Patent Office. This information will be found a handy reference for inventors, engineers, designers and production men in establishing the dates of record, as well as describing the important Diesel inventions.

Conducted by C. CALVERT HINES*

2,182,105

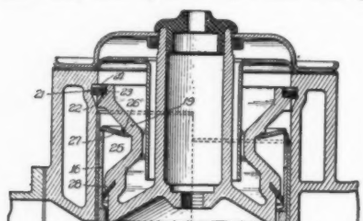
INTERNAL COMBUSTION ENGINE CYLINDER-HEAD CONSTRUCTION

Arthur A. Woodward, Detroit, Mich., assignor to Skinner Motors, Inc., Detroit, Mich., a corporation of Delaware

Application September 19, 1938, Serial No. 230,611

9 Claims. (Cl. 123—173)

1. In an internal combustion engine, the combination of an outer cylinder having port-means, a shorter inner cylinder inside of, concentric with, and spaced inwardly from said outer cylinder and terminating at one end short of the port-means of said outer cylinder, a split expansible sealing-ring bearing at its inner end on said end of said inner cylinder and having port-means registering with said port-means of said outer cylinder, a continuous hold-down ring bearing at its inner end on the opposite end of said sealing-ring, a cylinder-head mounted on said outer cylinder and having an inwardly facing circumferential shoulder, an endless washer-shaped spring substantially flat when not under strain, surrounding said cylinder-head and having a



shifting bearing at its inner portion solely on said cylinder-head shoulder and also having a shifting bearing at its outer portion directly on the outer end of said hold-down ring and under strain yieldingly maintaining said hold-down ring in longitudinal position and said sealing-ring against said end of said inner cylinder, a reciprocatory curved valve-means slidable lengthwise in the space between said cylinders and opening and closing the registered port-means of said outer cylinder and of said hold-down ring.

2,178,327

DIESEL FUEL

Ernest Frank Pevere, Beacon, and Wilfred N. Meyer, Newburgh, N. Y., assignors to The Texas Company, New York, N. Y., a corporation of Delaware.

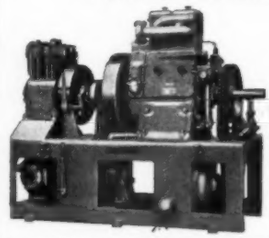
No Drawing. Application June 26, 1936, Serial No. 87,466

2 Claims. (Cl. 44—9)

1. The method of improving the ignition characteristics of a Diesel fuel, which comprises adding to the fuel a small amount of dipropionyl peroxide.

* Patent Attorney, 811 E. Street, N.W., Washington, D. C.

LISTER-BLACKSTONE MARINE DIESELS



Type 18/2 Auxiliary Unit: 18 B.H.P. 1600 R.P.M. 10 K.W. Gen. 44 cfm. Comp. 250 gpm. Pump

A COMPLETE LINE OF AUXILIARY UNITS. GENERATOR SETS FROM 2½ TO 25 K.W. WRITE FOR BULLETIN 150.

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MANZEL FORCE FEED LUBRICATORS for MOST EFFICIENT DIESEL ENGINE LUBRICATION

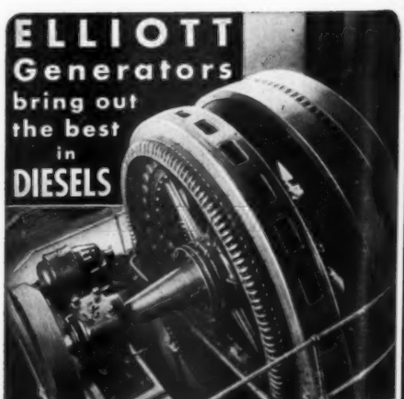
Model "94"

Engines equipped with Manzel Lubricators require a minimum of lubrication attention. After feeds are set, the only requirement is to keep reservoirs supplied with oil. Lubricators start, speed up, slow down and stop with the engine. Liquid-filled sight glasses show actual amount of oil delivered at lubrication point on each pump stroke. Manzel re-filling gun and screw make re-filling sight glasses easy without disconnecting oil lines or removing pumping units.

For full information ask for Catalog 94-B.

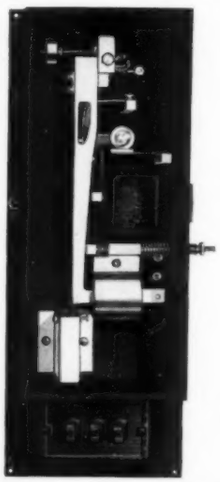
MANZEL BROTHERS CO.
275-277 Babcock St. Buffalo, N. Y.

ELLIOTT Generators bring out the best in DIESELS



ELLIOTT COMPANY
Electric Power Dept., RIDGWAY, PA.

GARVER - STILING
VOLTAGE REGULATOR



SIMPLE

FAST

EFFECTIVE

THE GARVER-STILING CO.
ELECTRICAL CONTROL EQUIPMENT
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DOUBLE SEAL
PISTON RINGS
Double Seal Ring Co. ★ Main Plant and Office FORT WORTH, TEX.
Branch Plant 137 Chambers Street New York City

A successful Diesel engine selling organization, located in the Pacific Northwest, is interested in expanding its line of products.
This dealer can sell either complete engines or accessories.
Write Box 126, DIESEL PROGRESS,
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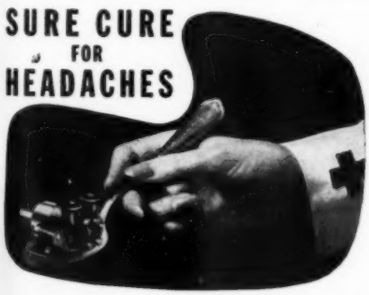
SURE CURE FOR HEADACHES



Here's one way to prevent pump service "headaches". Tuthill Pumps give you the dependable, carefree performance required in diesel service. There are types and sizes for all your lubrication and fuel-booster needs. Write for Small Pump Catalog today.

TUTHILL PUMP COMPANY
933 EAST 95th STREET, CHICAGO, ILL.

TUTHILL PUMP COMPANY 933 E. 95TH ST. CHICAGO, ILL.

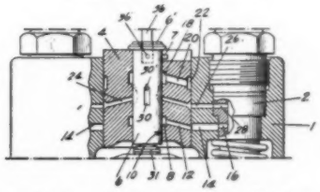
2,190,575

VALVE FOR FUEL PUMPS OF INTERNAL COMBUSTION ENGINES

Warner T. Tabb, Brooklyn, N. Y., assignor to Eisemann Magneto Corporation, New York, N. Y., a corporation of New York

Application February 20, 1937, Serial No. 126,893

8 Claims. (Cl. 251—76)



1. In a device of the class described, a valve member and a relatively movable cooperating member therefor, said members having a common cylindrical surface of contact at which relative motion of said members occurs, one of said members having longitudinally extending slots open to said cylindrical surface and symmetrically disposed on said member, each of said slots continuously cooperating with an edge on said cooperating member common to all of said slots to control the flow of fluid through said slots from corresponding separate sources of fluid under pressure outside said members in all positions of said members permitting flow of fluid.

2,186,812

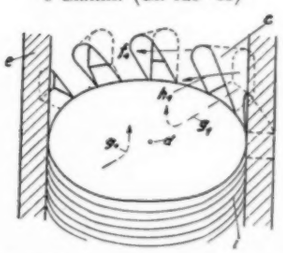
INTERNAL COMBUSTION ENGINE

Franz Zahren, Brunswick, Germany, assignor to the firm Bussing-Nag Vereinigte Nutzkraftwagen Aktiengesellschaft, Brunswick, Germany

Application December 18, 1937, Serial No. 180,482

In Germany December 19, 1936

6 Claims. (Cl. 123—65)



1. An internal combustion engine, especially a high-speed two-stroke internal combustion engine provided with direct current scavenging and inlet slots controlled by the working piston and distributed over the periphery of the cylinder in the same zone, in which engine the angle between the side faces of each slot and the tangent to the cylinder gradually varies from a value of less than 90 degrees to a total amount of about 90 degrees, and the angle between the upper faces of the slots and the axis of the cylinder differs from the angle between the lower faces of the slot and the axis of the cylinder.

2,189,106

INTERNAL COMBUSTION ENGINE

Alexander Garve and Oskar Kurtz, Augsburg, Germany, assignors to Maschinenfabrik Augsburg-Nurnberg A. G., Augsburg, Germany, a corporation of Germany

Application August 8, 1938, Serial No. 223,672

In Germany August 10, 1937

4 Claims. (Cl. 60—13)

4. A two-cycle internal combustion engine having a number of working cylinders disposed in a multiplicity of rows laterally spaced apart, pistons operable in said cylinders, said cylinders having exhaust ports adjacent one end of the cylinders and arranged to be covered and un-

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THIS ONE, SILENCER "B"

"A" In this municipal power plant located in the center of a small western town, the need was for the highest degree of silencing obtainable. Solution: Maxim MU2 silencers.

"B" A gasoline refinery—danger of explosion in exhaust lines of natural gas engines. Solution: Maxim Heavy Duty MUX1 Silencers.

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BLOWER CORPORATION

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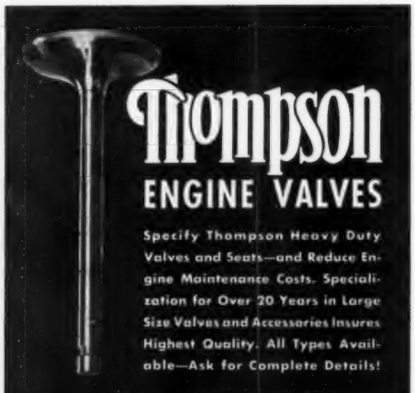
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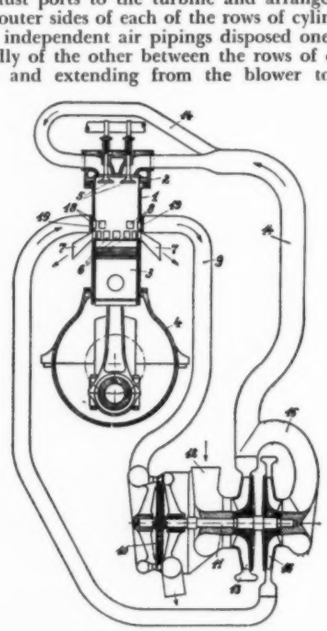
covered by the pistons, scavenging air inlet openings at the other end of the cylinders, said cylinders also having additional openings for supplying supercharging air to the cylinders and arranged to be covered and uncovered by the pistons, a turbine driven blower for separately supplying relatively low pressure scavenging air and relatively high pressure supercharging air respectively to the scavenging air inlet openings and the additional supercharging air openings, exhaust pipings leading from the said exhaust ports to the turbine and arranged on the outer sides of each of the rows of cylinders, and independent air pipings disposed one outwardly of the other between the rows of cylinders and extending from the blower to the



scavenging air inlet openings and the supercharging air inlet openings.

2,184,440

DIESEL FUEL AND THE METHOD OF PREPARING THE SAME

Bernard H. Shoemaker and Howard R. Batchelder, Hammond, Ind., assignors to Standard Oil Company, Chicago, Ill., a corporation of Indiana

No Drawing. Application August 9, 1937, Serial No. 158,140

12 Claims. (Cl. 44—9)

11. The method of obtaining Diesel engine fuel oils having improved ignition characteristics and substantially free of corrosive sulfur comprising treating a stove distillate obtained from a crude oil of the Winkler type with sodium plumbite in the presence of sulfur amounting to about 7 times the theoretical amount of sulfur required to normally sweeten

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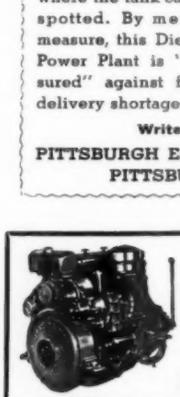

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1 to 6 cylinders, 25-165 H.P.
Both Rotations
Reduction Ratios to 4.4:1
Fresh water cooling is standard
GRAY MARINE MOTOR COMPANY
690 Canton Ave. Detroit, Mich.

such a distillate, distilling the treated stove distillate to produce an overhead amounting to about 30% of the original stock and a bottom stock amounting to about 70% of the original stock, further reducing said bottom stock by suitable means to produce a reduced bottoms amounting to about 1% to about 6% of the original stove distillate and adding 0.5% to 5% of said reduced bottoms to distillate fuel oils having undesirable ignition characteristics.

2,180,883

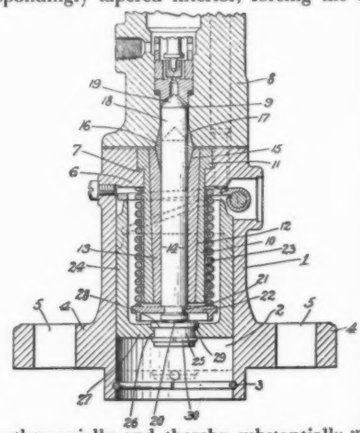
FUEL PUMP ASSEMBLY

Philip Lane Scott, Chicago, Ill., assignor to Super Diesel Tractor Corporation, La Porte, Ind., a corporation of New York

Application November 12, 1936, Serial No. 110,485

6 Claims. (Cl. 29—149.5)

2. The method of sizing a liner in a multi-part pump barrel, which includes the steps of forming a hollow liner with tapered exterior, leaving the interior size thereof greater than that finally necessary, forming a hollow sleeve with correspondingly tapered interior, forcing the two



together axially and thereby substantially uniformly decreasing the internal size of the liner to the desired final substantially uniform size.

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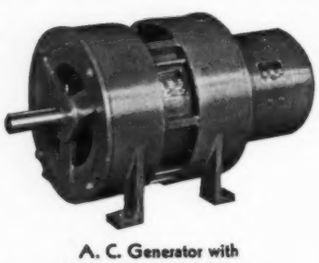

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DIESEL PROGRESS

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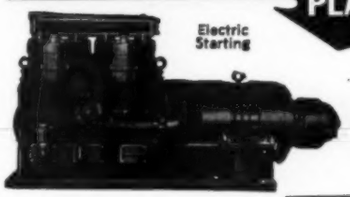

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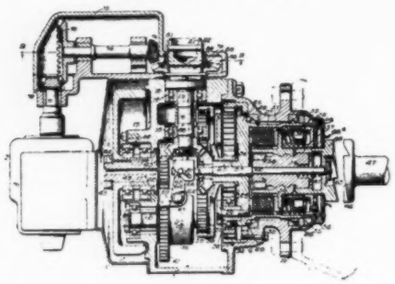
FOR DIESEL ENGINES
VIKING INSTRUMENTS, INC.
Stamford, Connecticut

2,181,333

ENGINE STARTING MECHANISM

Raymond P. Lansing, Montclair, N. J., assignor to Eclipse Aviation Corporation, East Orange, N. J., a corporation of New Jersey

Application May 27, 1930, Serial No. 456,273
Renewed March 9, 1937
11 Claims. (Cl. 123—179)



1. In combination with engine starting apparatus, current supply means, a gear train between the starting apparatus and the supply means, said gear train being operable to transmit driving effort either to or from said starting apparatus, and auxiliary spring driving means operable through said gear train for simultaneously actuating said supply means and starting apparatus.

YM LUBE OIL PURIFIERS REMOVE FUEL DILUTION . . ACIDS . . . SLUDGES . .
Clean Oil . . . Clean Engines
YOUNGSTOWN MILLER CO., INC.
SANDUSKY, OHIO

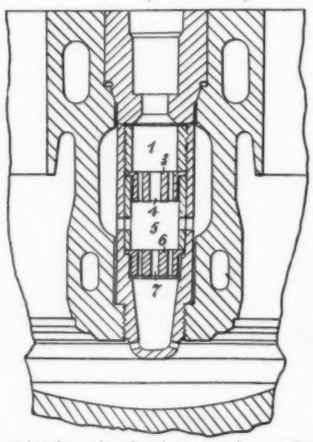
PETROMETER
FOR TANK GAUGING EQUIPMENT FOR DAY TANKS & CLEAN OIL STORAGE
PETROMETER CORPORATION
6 STAR SQUARE LONG ISLAND CITY, N. Y.

2,185,918

PRECOMBUSTION CHAMBER FOR DIESEL ENGINES

Franz Koch, Essen, Germany

Application March 28, 1938, Serial No. 198,516
In Germany April 2, 1937
1 Claim. (Cl. 123—33)



In a Diesel engine having a main combustion space and a fuel injection nozzle, a precombustion chamber arranged to receive the fuel from said fuel injection nozzle and communicating with the main combustion space, said precombustion chamber having a plurality of partition members arranged therein so as to lie in the path of the fuel jet from the injection nozzle and divide the precombustion chamber into a plurality of spaces, each of said partition members having a large central aperture located in the path of the fuel jet so as to allow the greater part of the fuel to pass unhindered to the other side of the partition member, the central aperture in each successive partition member being of smaller diameter than that of the central aperture of the partition member nearer the fuel nozzle, so as to hold back progressively larger quantities of fuel particles at the edge of the fuel jet, said partition members having a plurality of smaller apertures in the marginal regions thereof for admitting air to said fuel particles, so as to form therewith a series of ignitible mixtures in precombustion chamber.

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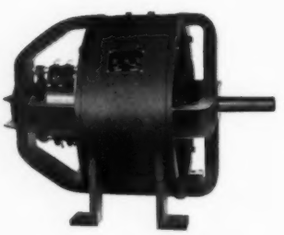

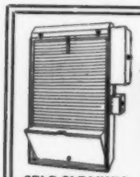
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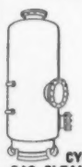
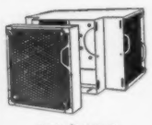

CYCOIL GAS CLEANER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Automatic self-cleaning air filters are used on large engines and compressors. Ask for Bulletin No. 240-C.
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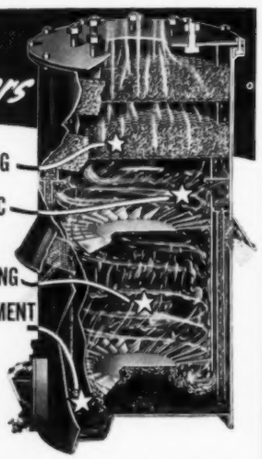
Type OCH filters are washable viscous impingement type air filters. Ask for Bulletin No. 120-B.

AMERICAN AIR FILTER CO., INC.
Incorporated
179 Central Avenue Louisville, Ky.

4 FILTERING
3 CYCLONIC ACTION
2 SCRUBBING
1 IMPINGEMENT


CYCOIL OIL BATH AIR CLEANER

AMERICAN AIR FILTERS

2,177,719

DIESEL FUEL

William H. James, Paulsboro, Robert C. Moran, Wenonah, and Edwin M. Nygaard, Woodbury, N. J., assignors to Socony-Vacuum Oil Company, Incorporated, New York, N. Y., a corporation of New York

No Drawing. Application October 14, 1937, Serial No. 168,900
5 Claims. (Cl. 44—9)

1. An improved Diesel fuel comprising: hydrocarbon fuel oil and in admixture therewith a minor proportion of bis (diamylamine) disulfide in sufficient amount to decrease the ignition delay period of the fuel.